The
Mysteriouser
REFLEX

A Vintage Radio MONOGRAPH

by

D. H. MOORE

The Editorial Group, Ltd...

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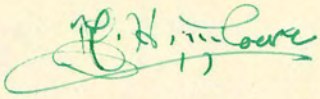
DEDICATION

....to a way of life
that should not have
been forgotten.



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PREFACE

Electrically, there was no advantage to reflexing. Also, care of a critical kind had to be exercised in construction. It's only advantage was that it was cheap to build.

By 1922 the regenerative and super-regenerative circuits were much in vogue, all based upon the Armstrong patent - which was subsequently rendered invalid by the Supreme Court in favour of De Forest.

The reflex was the first circuit to become popular after Armstrong's regenerative types. It was quite popular for several seasons despite the fact that nothing new could be added to it. The vogue of the reflex culminated in the elabourate "inverse duplex" concept, and giving Grimes enduring fame, to where he was noticed by the Octupus.

Many well-known radio-men and manufacturers of the period had a go at designing reflex circuits, among whom were Flewelling, Harkness, Haynes, Priess, Acme, Erla, Rauland. Examples of their circuits will be found in the following pages. Naturally, radio media were not above filling their pages with "improvements" on the reflex, and much quasi-technical nonsense was published, one example being given later on in these pages.

It would appear that the re flex was a mystery to many a home-constructor of the period, and it would also seem that to many today, the reflex remains a mystery. It was after receiving numerous appeals from hobbyists across the country (chiefly readers of my Sketch-Books and Monographs) to create this Monograph, that I decided to have a go and this is the result. It will be added to the list of Monographs on the back cover.

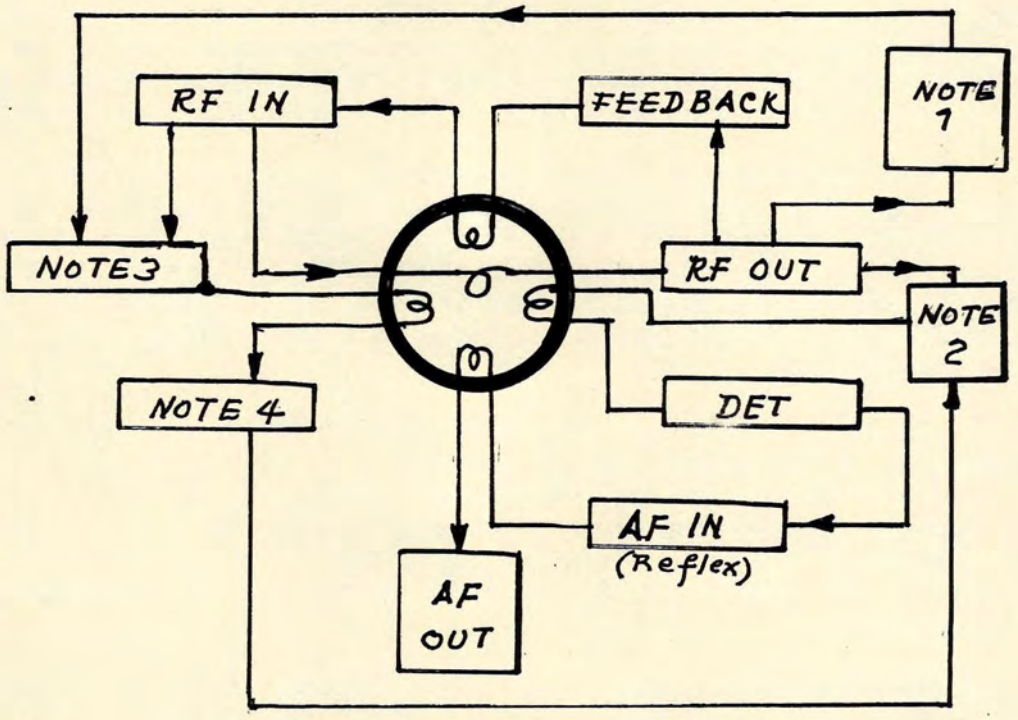
Simply stated, a reflexed circuit relates to the doubling of the use of a vacuum tube amplifier at both RF and AF frequencies. But a reflexed tube is NOT relateable to our latter-day dual-purpose tube despite the similarity of designations.

In the reflexed amplifying tube the plate current is traversed by two current, either of which may overload the tube. A fixed, or determined-by-test condenser is mandatory to shunt the PRI and SEC of the AF transformer and phones. Otherwise, losses and severe voltage-dropping would be experienced, to where no signal at all came through.

Needless to say, all relfexes radiated.

The idea of reflexing a tube grew out of the findings that a vacuum tube was capable of multiple functions, such as:

1. RF Amplification
2. AF Amplification
3. Self-Oscillation
4. Heterodyning
5. Detection
6. AF Reflexing
7. Phase Adjusting
8. Super-Regeneration
9. RF or Regeneration Reflexing
10. Reflexing of Heterodyne Frequency Output



NOTES:
1. Self-Oscillation.
2. Phase Adjuster.
3. Self-Heterodyne/Alternating Grid Control.
4. Heterodyned RF Output/Super-Regen.

THE POSSIBILITIES of ONE TUBE

The obvious question was raised early on - if one tube is capable of multiple functions, why not simply use one tube? While there is no theoretical reason why only one tube could be used, excepting of course that the capacity of the tube and the difficulty of arranging a non-interferring circuit in correct phase relation. Contrary to many, boiling down the number of tubes has no special advantage - other than saving the cost of tubes.

Like many early "new" radio circuits, the advent of the reflex seemed to promise something radically new, but consideration if given, to the reflex principle of operation, will show that there was really nothing new in the phenomena.

* * * *

The use of crystal detectors was, of course, quite fashionable and were immediately prest into service for the reflex. But a crystal had to be absolutely perfect, and very few were. Many would not rectify at all. Another disadvantage was the constant element of uncertainty that entered in the construction of a reflex. One was never certain about just what would occur. A fixed condenser, for example, placed at different spots in a TRF circuit might not affect the operation at all but would radically alter the operation of the reflex.

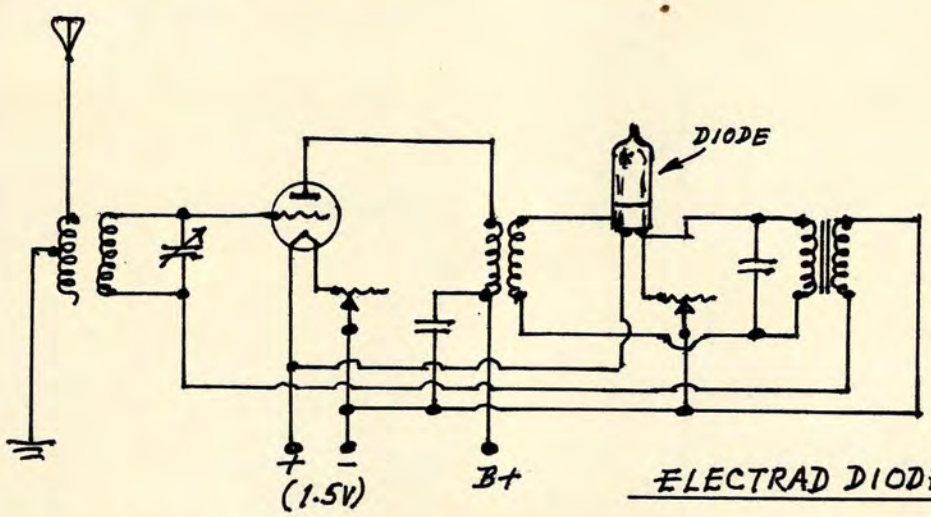
Those early reflexes which were successful always specified an awesome list of mandatory compents, usually found by the designer from many a cut-and-try experiment. Use of any other component would produce quite different results.

When using a crystal detector, the adjustable type was preferred, keeping in mind that if the crystal was jarred, a tube would immediately go into violent oscillation. This difficulty was usually but not always obviated by arranging the PRI and SEC windings so that both were in resonance. One of the more successful applications of this was in the Ballantine "Variotransformer", which will be found detailed inside the pages of Vol. II of the Sketch-Books.

When regeneration was used with the reflex even in the best of circuits, audio frequency whistles were bound to occur. This was usual and could be alleviated most of the time by inserting a 100K-ohm rheostat across the Grid and Filament of the tube. This will not affect or diminish the signal, but would control the circuit.

The greatest draw-back to using a "cat-whisker" type crystal detector was the incessant need to be forever fooling around with the cat-whisker. Eventually, one gave up in anger, frustration, or laziness, even as now. A solution was offered by using a diode detector, a good example of the better ones being that designed by Electrad, and depicted over-leaf. It was a vast improvement, but did not endure.

Donle's original S-13 was also innovative and improved many a reflex circuit, but that, too, was short-lived, as the radio world and wife rushed on to another day.



ELECTRAD DIODE REFLEX

Operation is simple: the received signal was equal to any crystal, and needed no further adjustment for wavelength changes; the rheostat was set to the most sensitive point and left there.

For some inexplicable reason the reflex continued to be popular in Europe, perticularly France, until the Thirties, undoubtedly because of the Frenchman, Latour, who designed many reflexes. Latour was famous, not only in France but throughout Europe, as the man who was leading the team of Americans, Englishmen, Frenchmen during the last year of WWI, to result in the Armstrong super-het, which we've all heard about. You will find a few Latour reflexes in the following pages.

You will also find a plethora of reflex circuits covering, more-or-less, the full gamut of the reflex, and culminating in the final sophistication introduced by Grimes, with his "inverse duplexes". In looking over several diagrams you will note that the circuit constants were, for all practical purposes, generally the same. Because of this, not all values or constants are repeated, as this would make for redundantcy. If you have any question, however, please feel free to write to me, or the publishers, and you'll receive a reply by return post.

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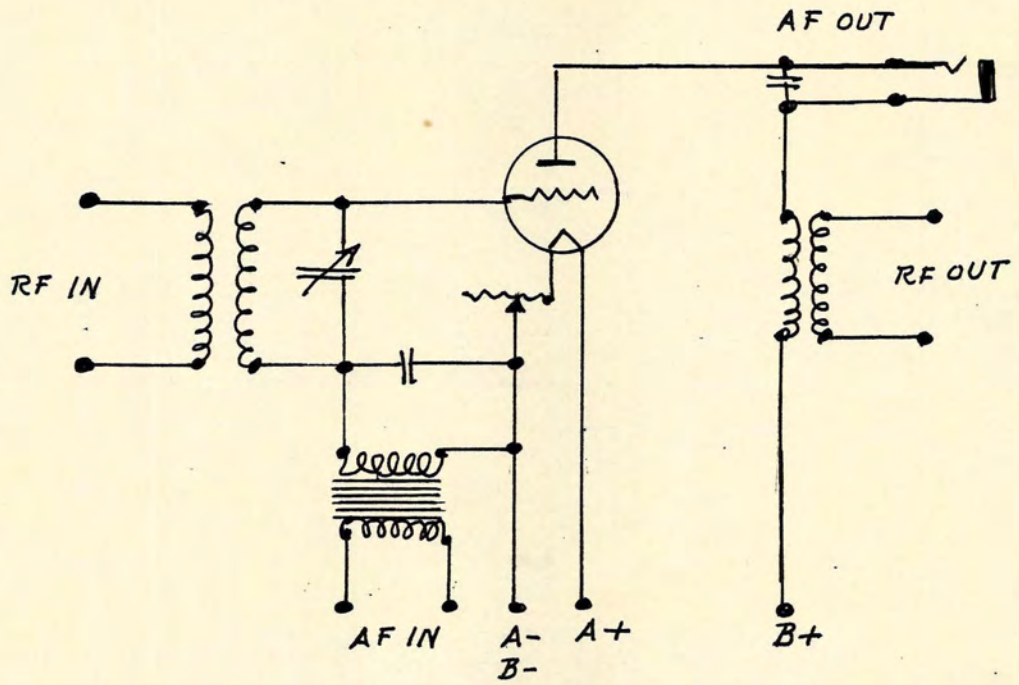
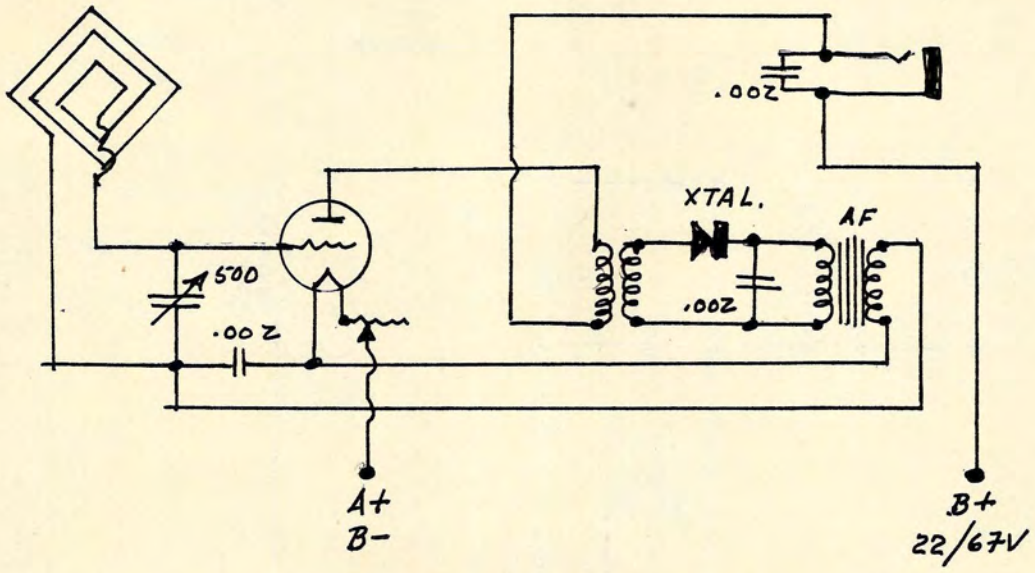


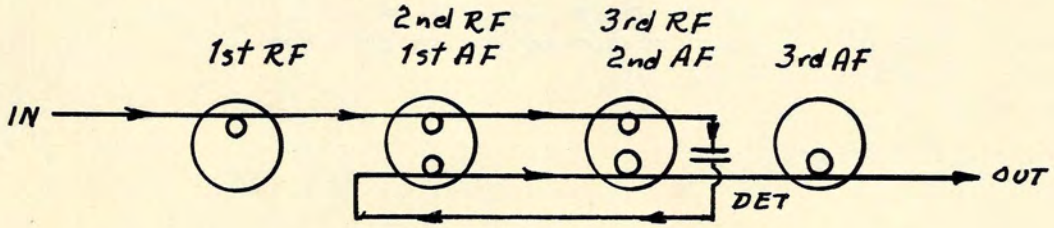
GENERAL PLAN...

...of both RF and AF frequencies in and out, with the frequencies seperated. Units of this kind can be connected to similar units, or to other circuits. Essentially, this may be considered as the 'heart' of any reflexed circuit.

* * *

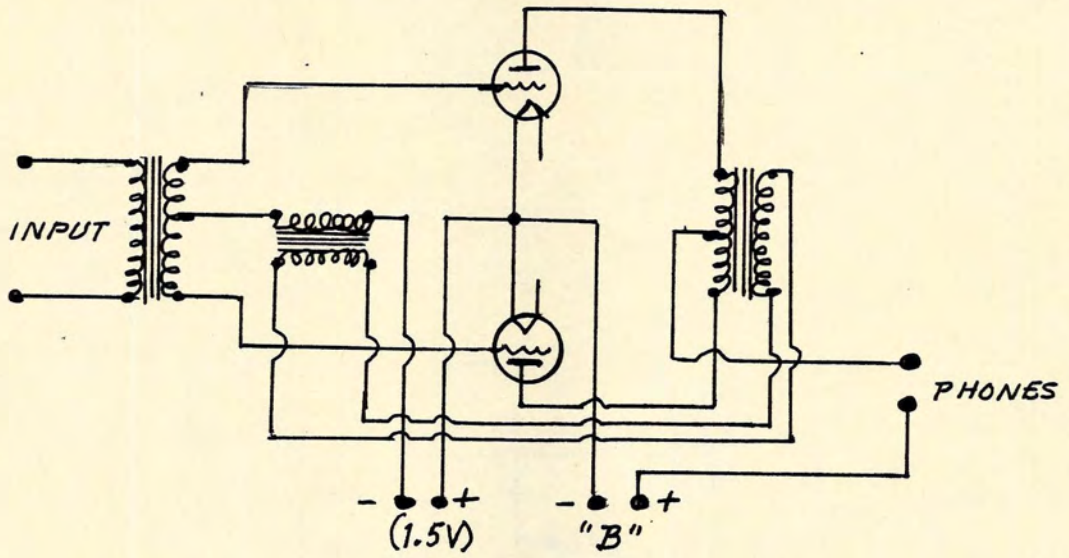


SIMPLEST FORM of 1-TUBE REFLEX, SHOWING PRINCIPLES of OPERATION.



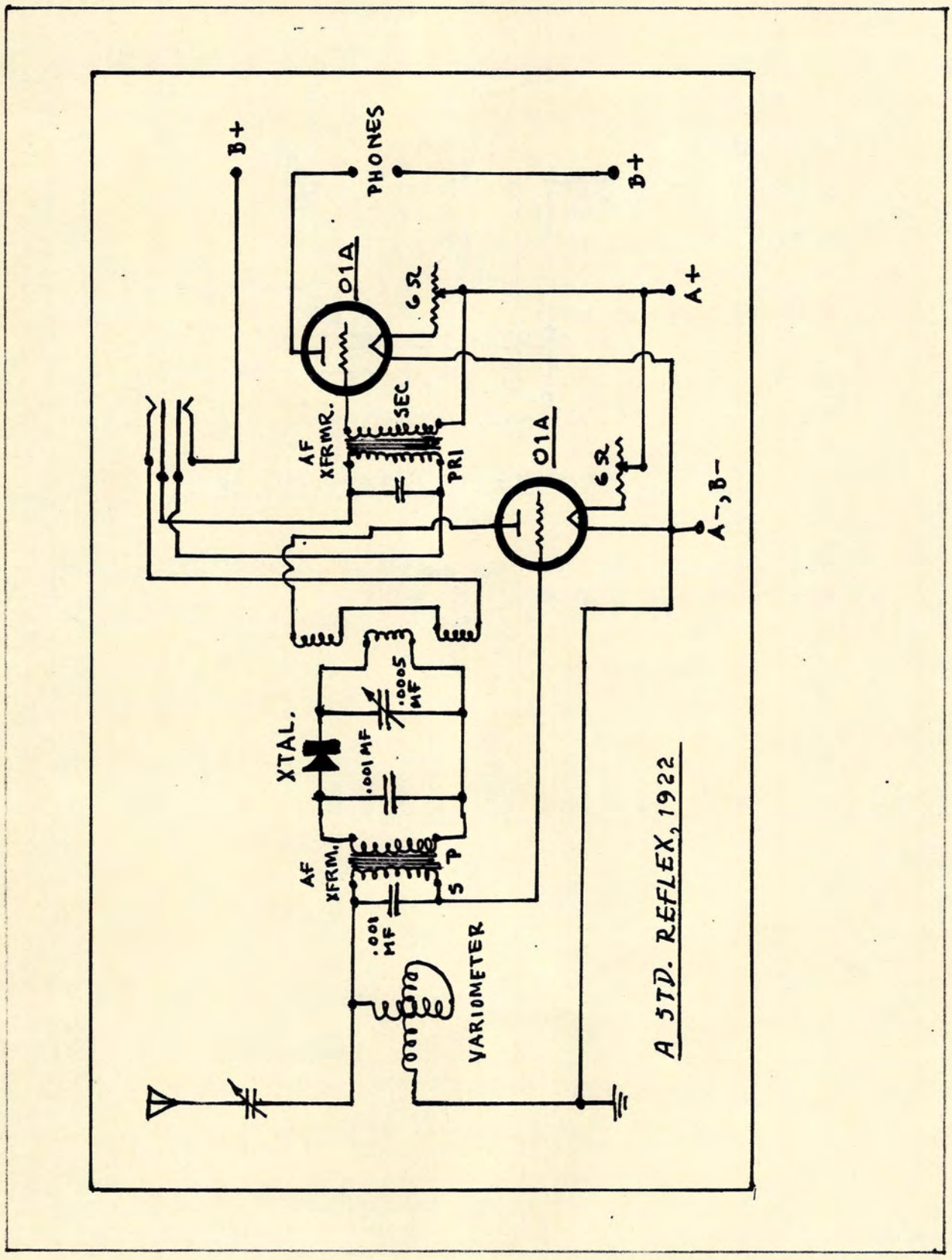
REFLEX PRINCIPLE EMPLOYED BY ACME, ERLA, PRIESS, SQUIRE, etc.

1st stage of RF amplification only, & the last stage as AF amplification only was quite advantageous.



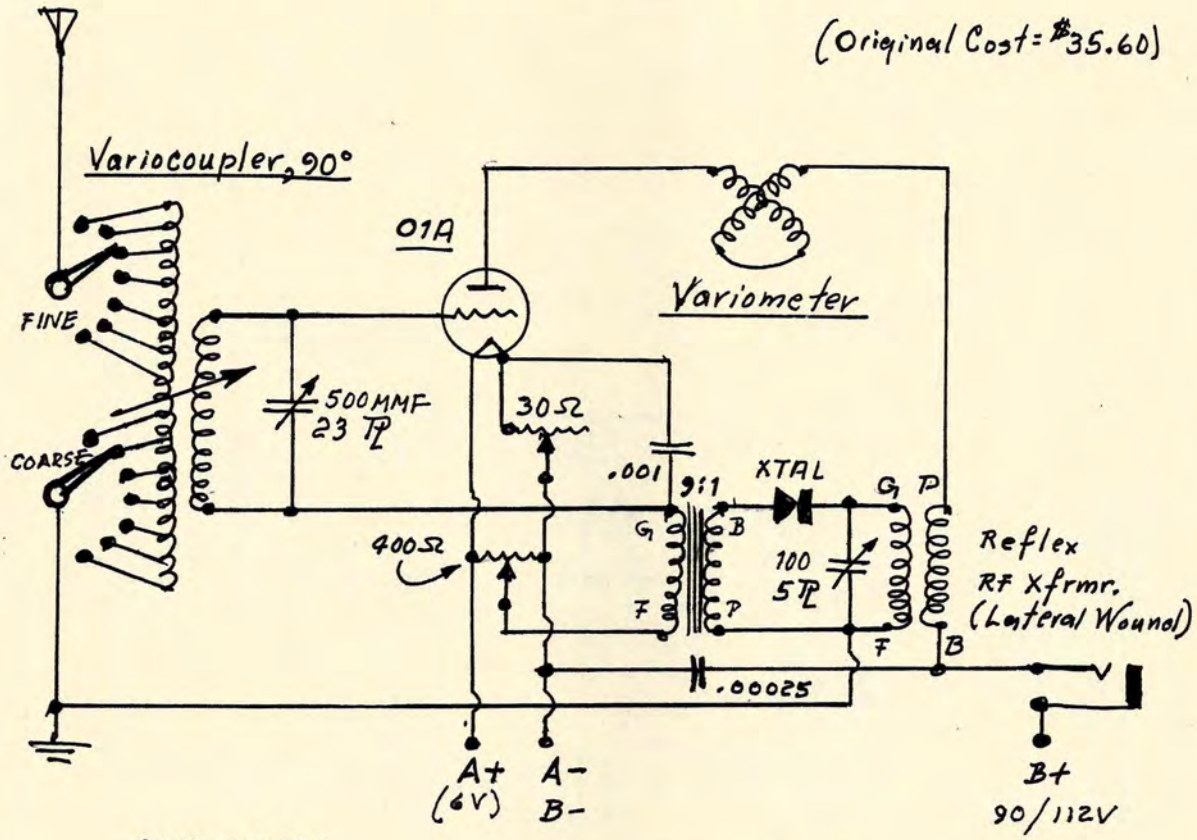
A TECHNICALLY FLAWED CONCEPT

The normal output is fed back into the imput, and the phones connected where distortion is the greatest. The amplifier would howl, as the out put is fed back into the input without the usual change of frequency.


B+
PHONES
B+
A+
A-, B-
01A
6 Ω
01A
6 Ω
AF XFRMR.
SEC
PRI
.0005 MF
.001 MF
XTAL.
AF XFRM.
S P
.001 MF
VARIOMETER
A STD. REFLEX, 1922

A REGENERATIVE REFLEX OF 1922

(Original Cost = $35.60)



COIL DATA:

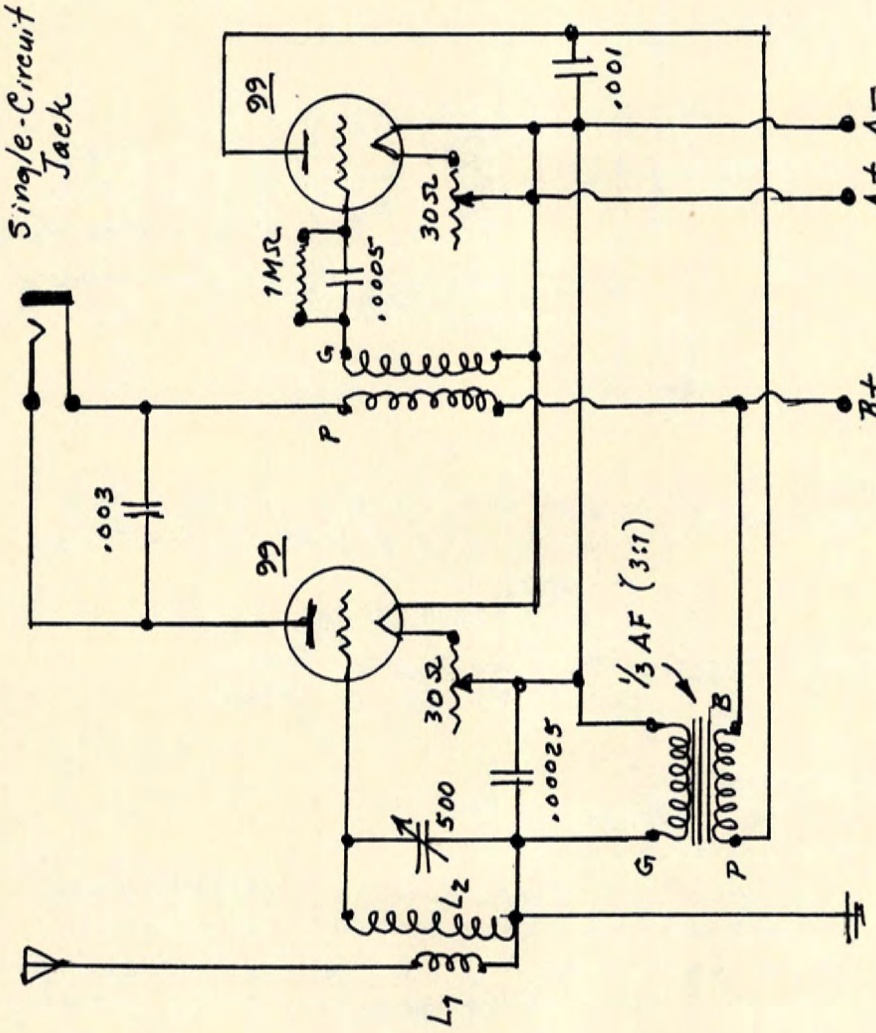
Variocoupler = Stator, 48T #22 SCC: 8 single twin taps to ANT, & 5 taps of 8T each to GND.
Rotor, 50T #24 SCC.

Variometer = 60T #20 SCC on Rotor.
60T #20 SCC on Stator.

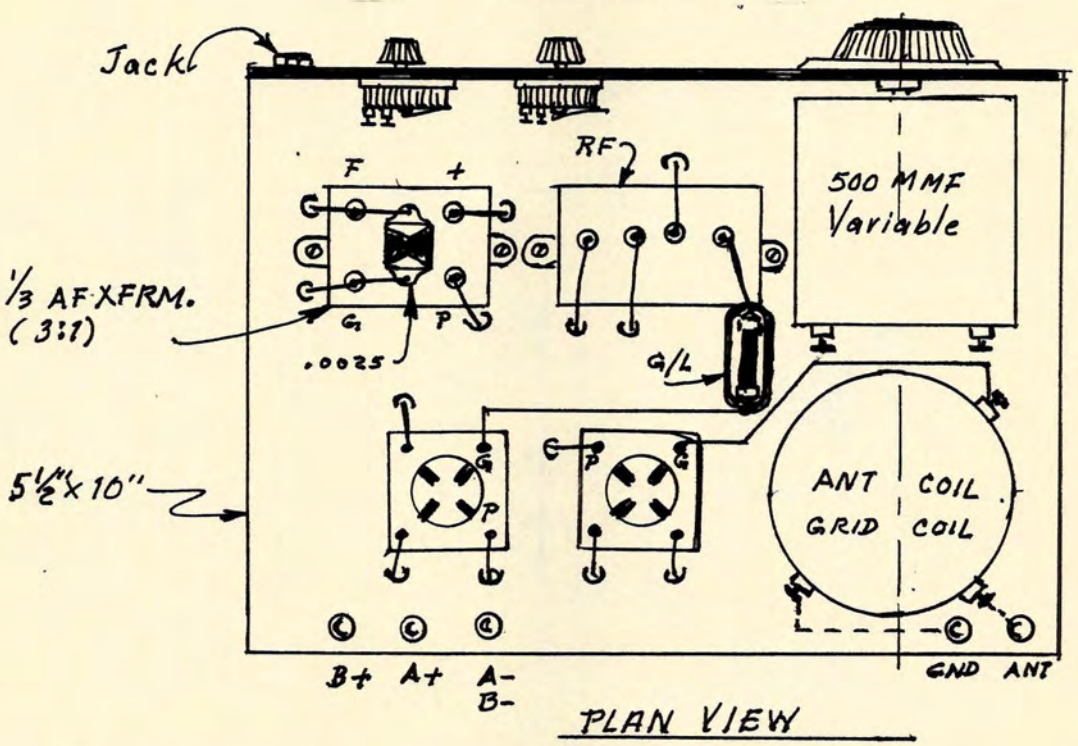
TUNING PROCEDURES:

1. Set FIL rheostat @ 50.
2. Place variables @ 50.
3. Cut in PRI of coupler, a few turns @ a time.
4. Signals may be heard, or tube will oscillate.
5. If oscillating, adjust Variometer to clear-up.
6. Adjust rotor of Variocoupler & 2nd Variable.
7. If tube goes into oscillation, touch Grid lead w/ your finger, simultaneously retard Variometer rotor.

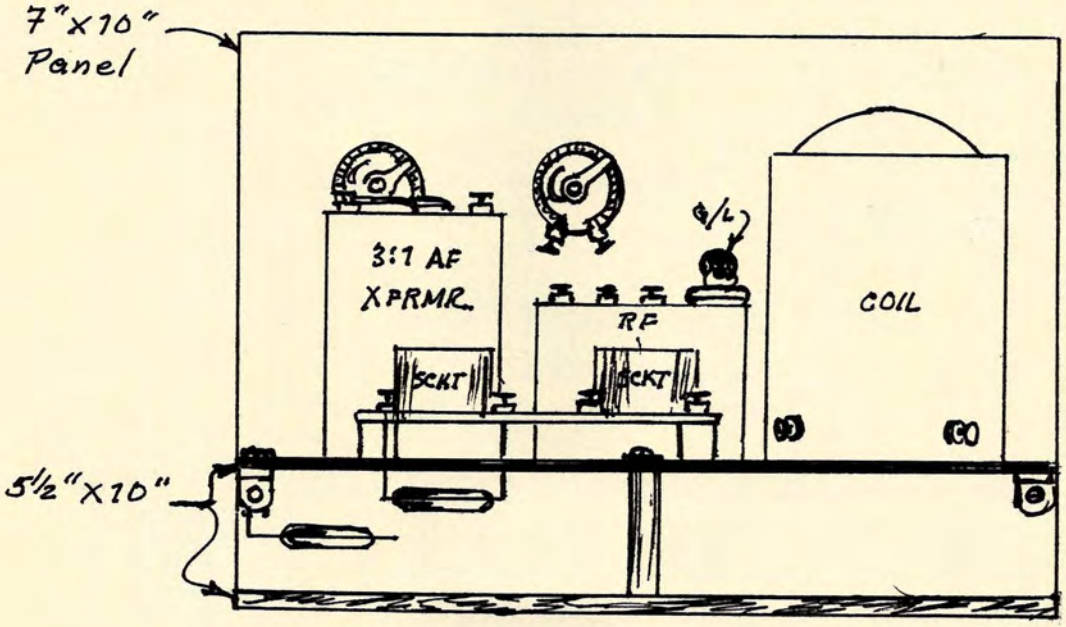
A SIMPLE 2-TUBE REFLEX; Sht. 1



A SIMPLE 2-TUBE REFLEX; Sht. 2



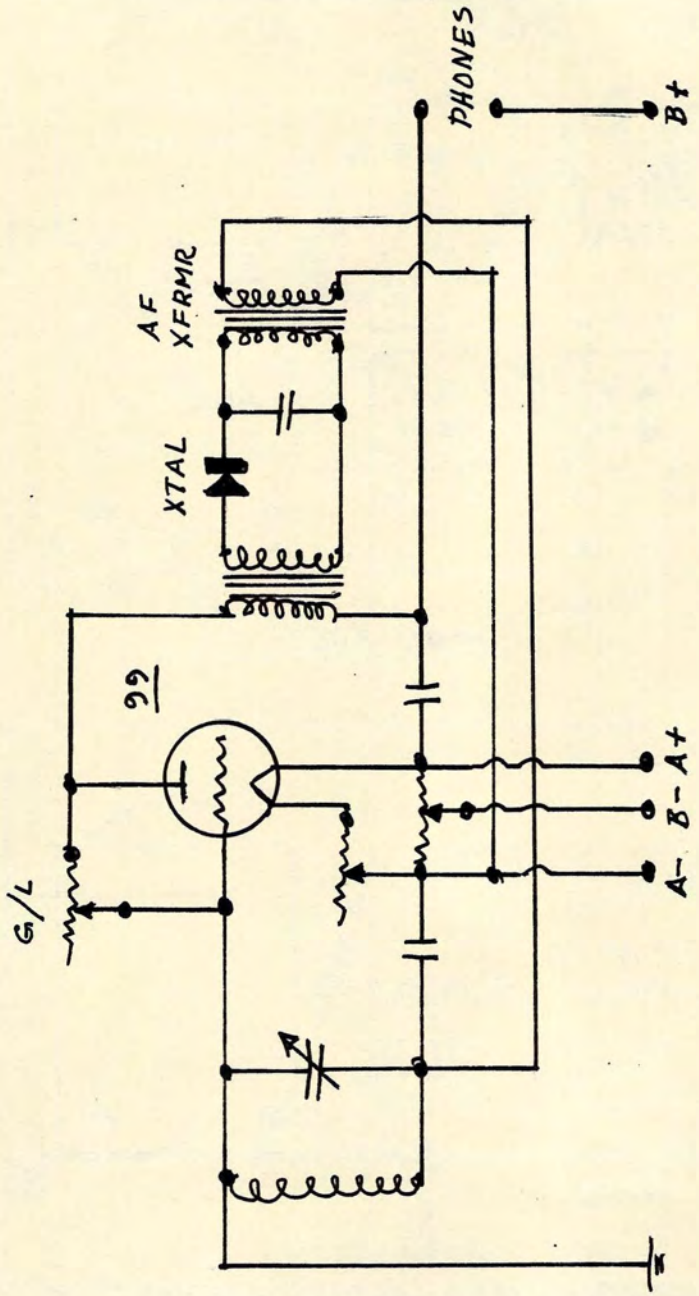
PLAN VIEW



REAR VIEW

(RD)

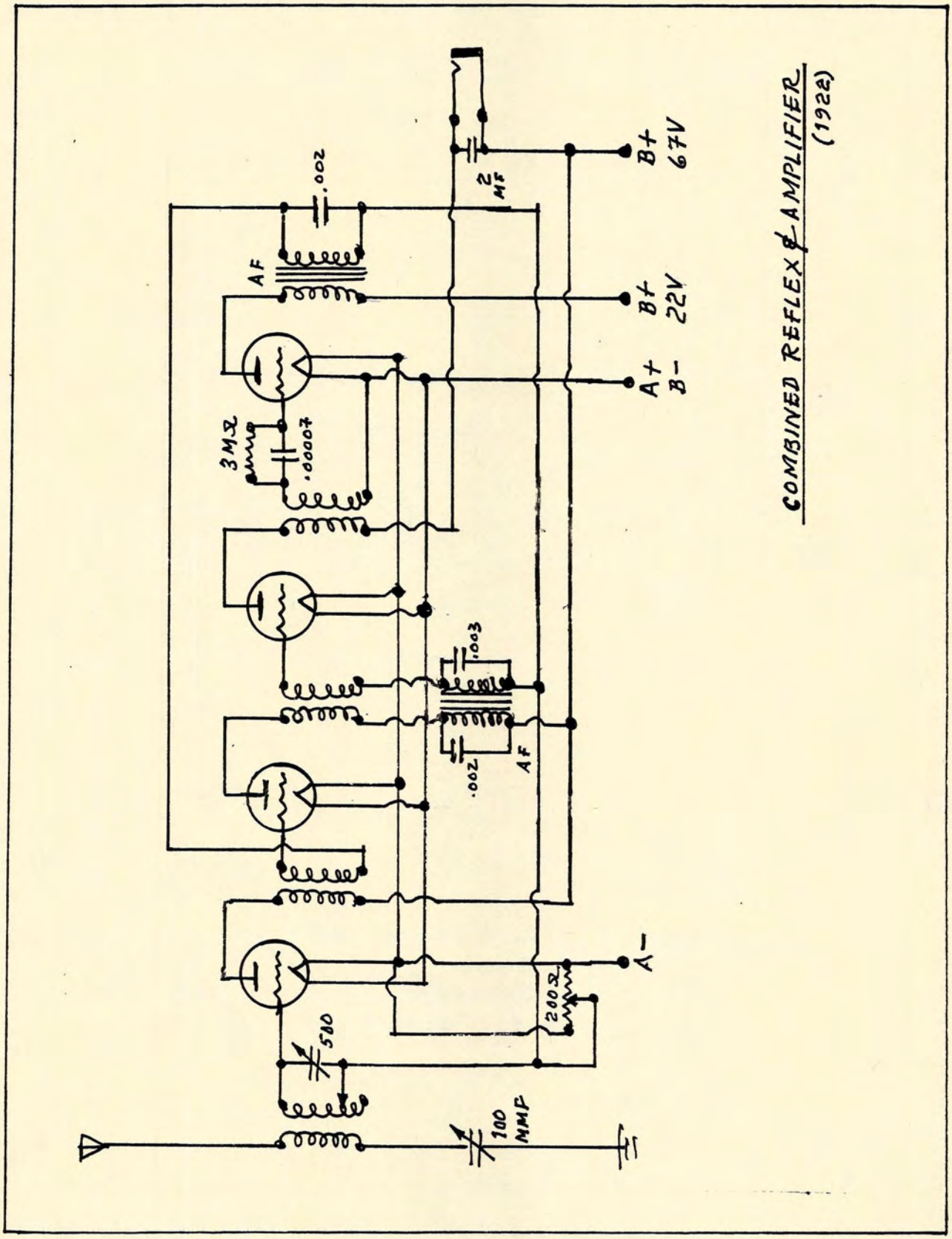
THE "PHANTOM" REFLEX



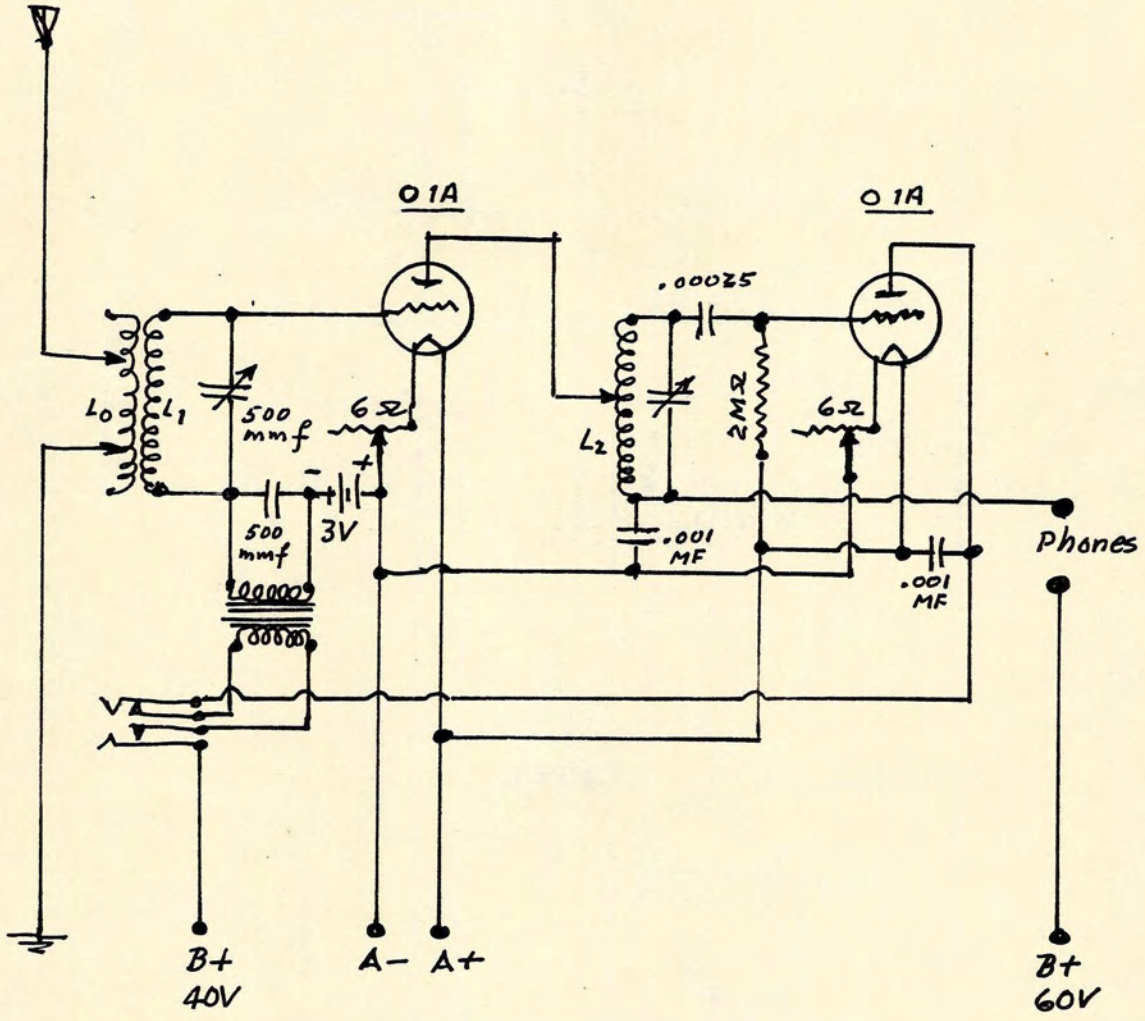
THE "PHANTOM" REFLEX

(Name derives from the fact that no ANT was employed.)

RF output was rectified by the DET & put into the Grid circuit as an AF circuit.

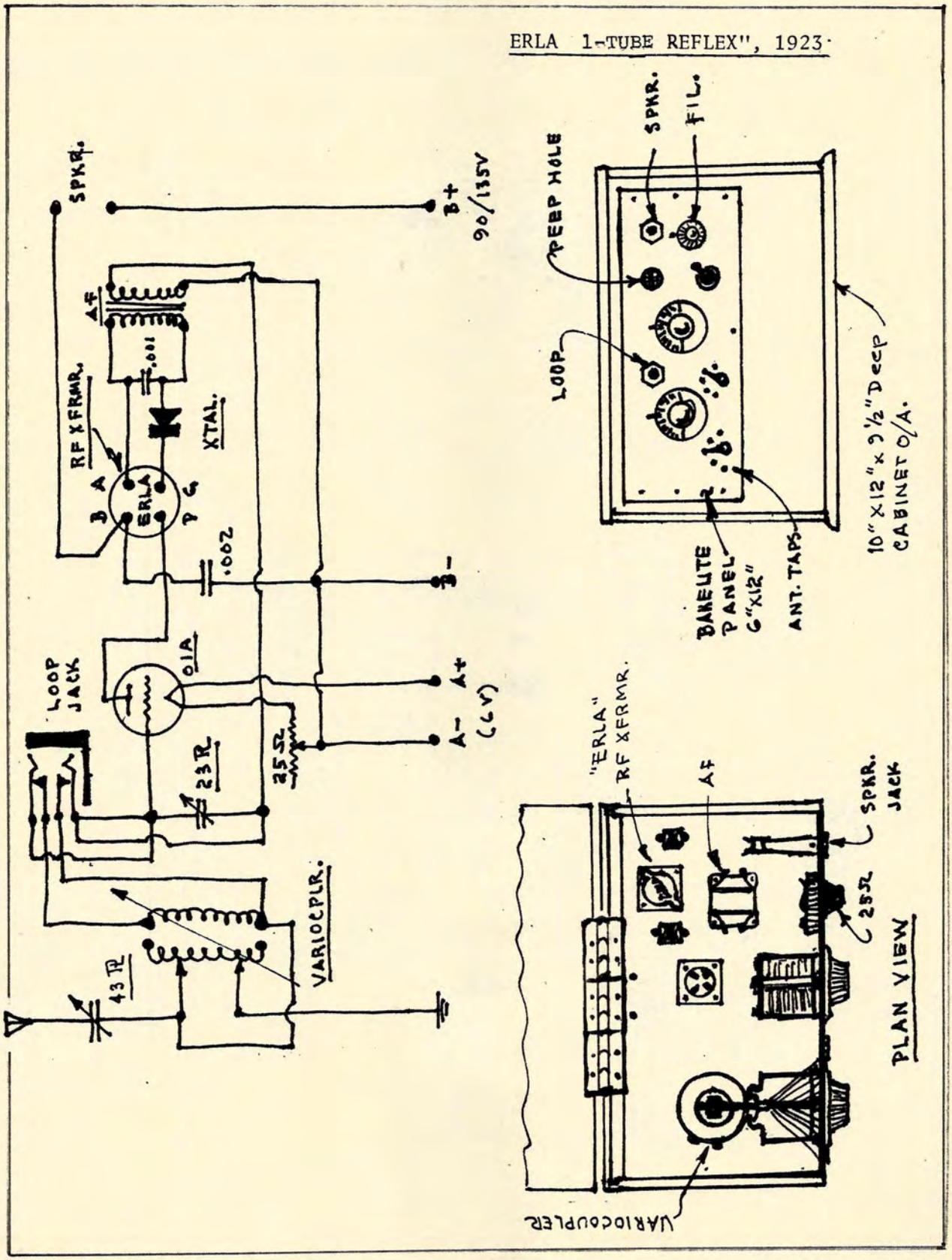

COMBINED REFLEX & AMPLIFIER
(1924)
B+ 67V
B+ 22V
A+
B-
A-
.002
2 MF
AF
3 MΩ
.00007
.003
.002
AF
200Ω
500
100 MMF

REFLEX WITH VARIABLE IMPEDANCE COUPLING, 1923

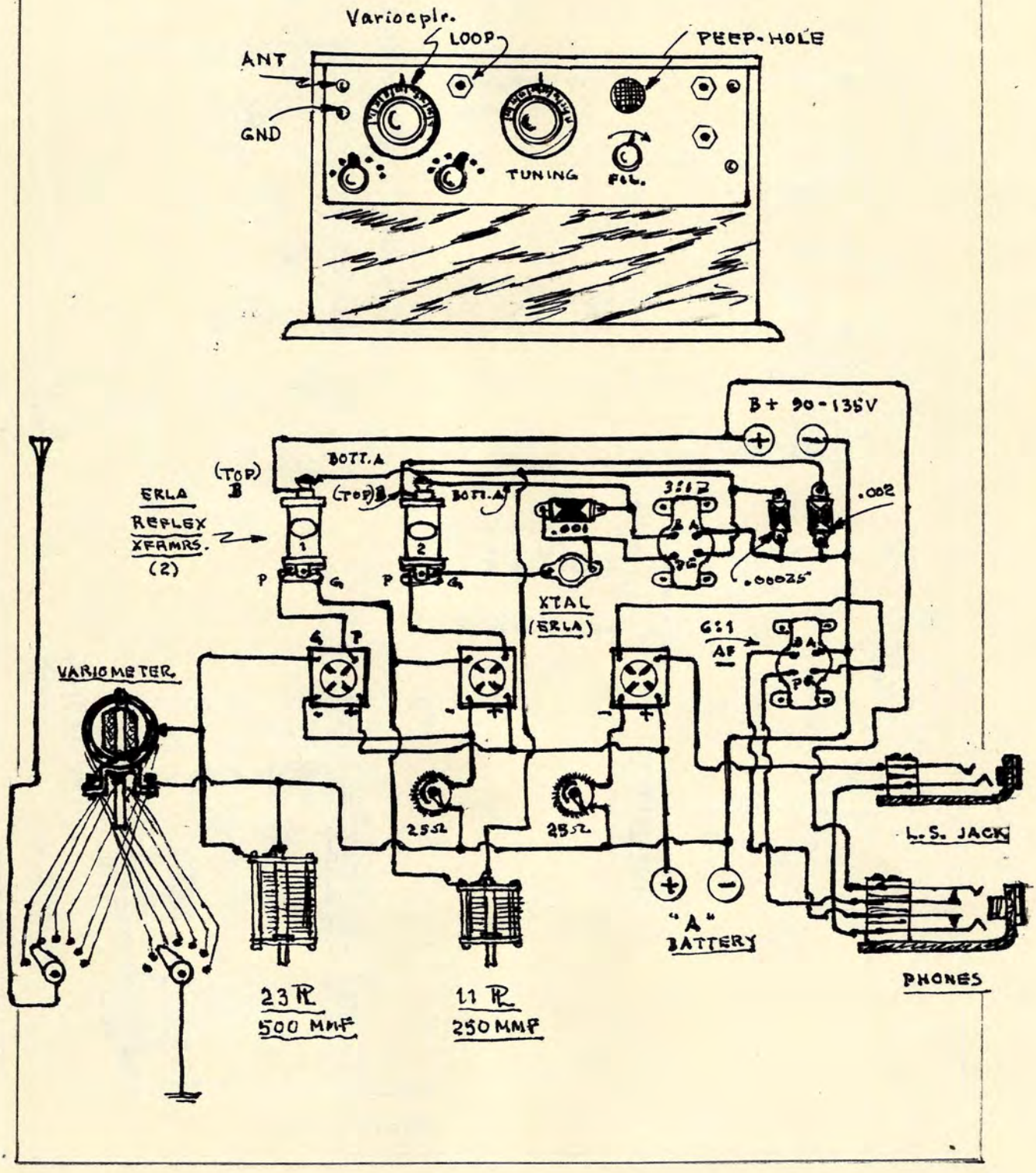


COIL DATA: L_0 = 60T #22 DCC; 3½"ϕ form; tapt @ every 10T.
L_2 = Same as L_0, tapt every 5T.
L_1 = 45T #22 DCC; 3½" form..

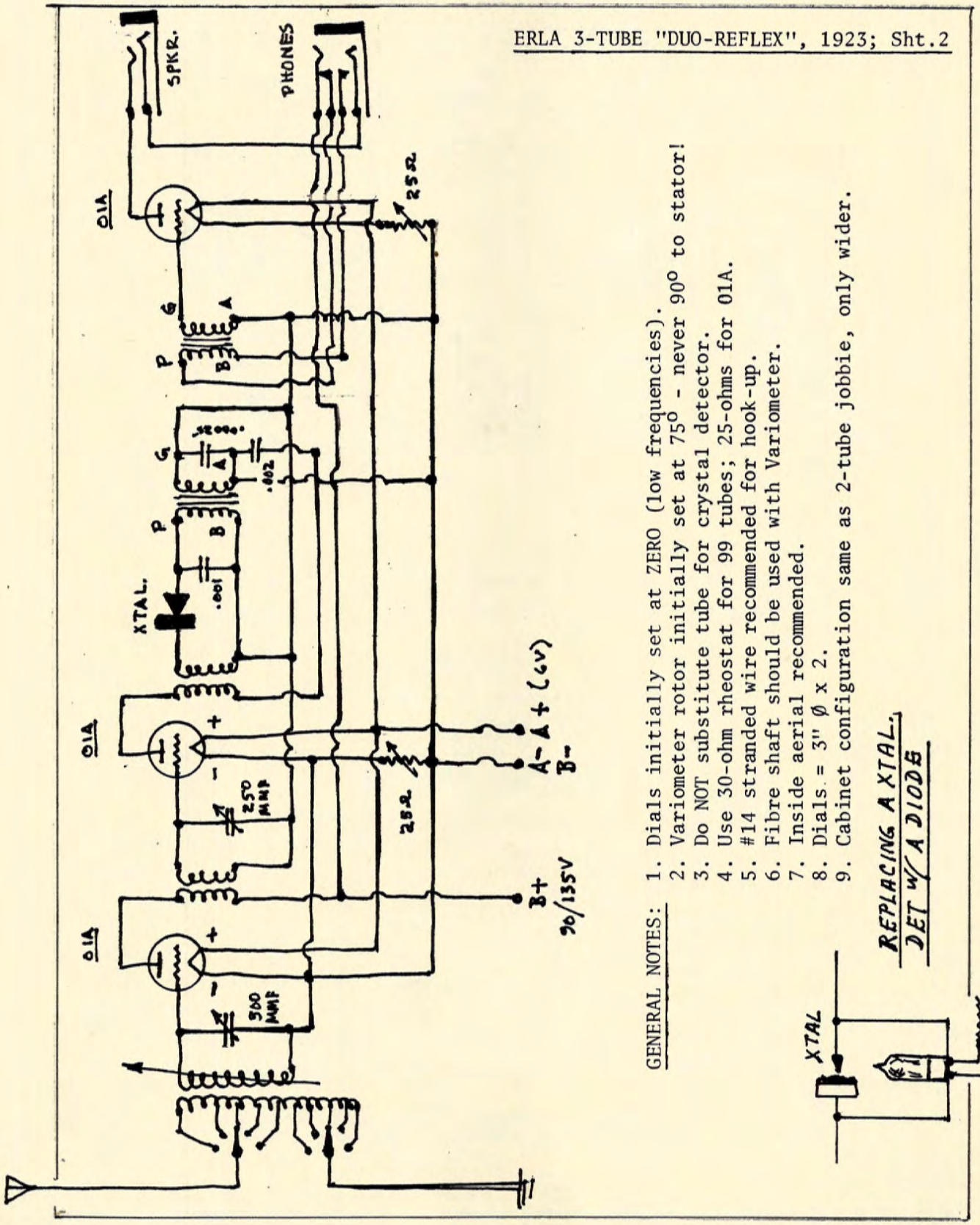
(Henley)


ERLA 1-TUBE REFLEX", 1923
SPKR.
B+
90/135V
AF
.001
RF XFRMR.
XTAL.
ERLA
.002
B-
LOOP JACK
01A
A-
A+
(6V)
23 R.
25 R.
43 R.
VARIOCPLR.
PEEP HOLE
SPKR.
FIL.
LOOP
BAKELITE PANEL 6"x12"
ANT. TAPS
10" x 12" x 9 1/2" Deep CABINET O/A.
"ERLA" RF XFRMR.
AF
SPKR. JACK
25 R.
VARIOCOUPLER
PLAN VIEW

ERLA 3-TUBE "DUO-REFLEX", 1923;Sht.1

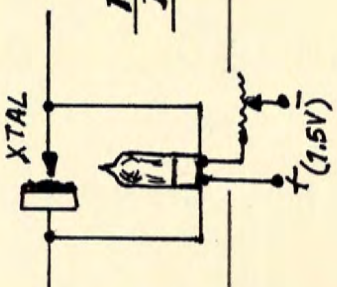


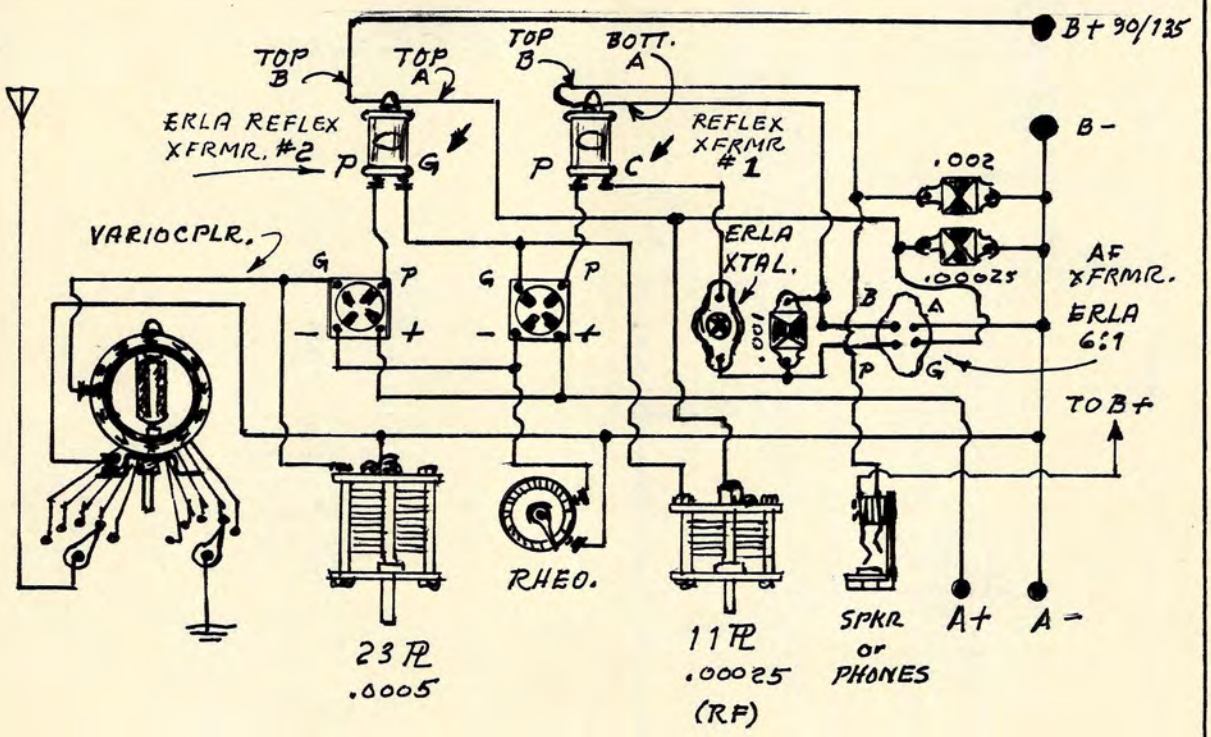
ERLA 3-TUBE "DUO-REFLEX", 1923; Sht.2



GENERAL NOTES:

1. Dials initially set at ZERO (low frequencies).
2. Variometer rotor initially set at 75° - never 90° to stator!
3. Do NOT substitute tube for crystal detector.
4. Use 30-ohm rheostat for 99 tubes; 25-ohms for 01A.
5. #14 stranded wire recommended for hook-up.
6. Fibre shaft should be used with Variometer.
7. Inside aerial recommended.
8. Dials = 3" Ø x 2.
9. Cabinet configuration same as 2-tube jobbie, only wider.





Note difference between "G" & "C" terminals on RF xfrmrs.
Tuning range = 200 to 700 Meters. "C" = Crystal.

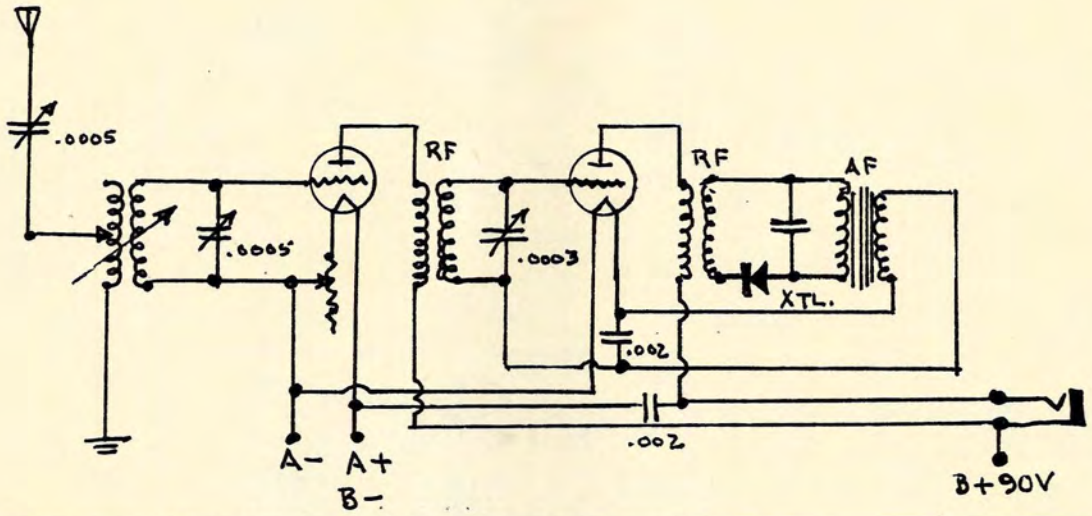
TUNING

1. Set Varioeplr. switches on similar taps.
2. Turn Rotor of Varioeplr. to 45°.
3. Rotate dials of both Variables together.
4. Adjust both dials for max. clarity.
5. Adjust Rotor to clarify signal.
6. A certain degree of variance or lag must be maintained between Variable dials as they are rotated.
7. Rheostat setting is not critical.
8. 200 Meters picked up w/ dials near Zero.
9. Use an indoor aerial rather than a loop.
10. At exactly Zero coupling, a howl will be heard. This setting should be approached but never reached. (Zero eplng. = rotor & stator @ 90°.)

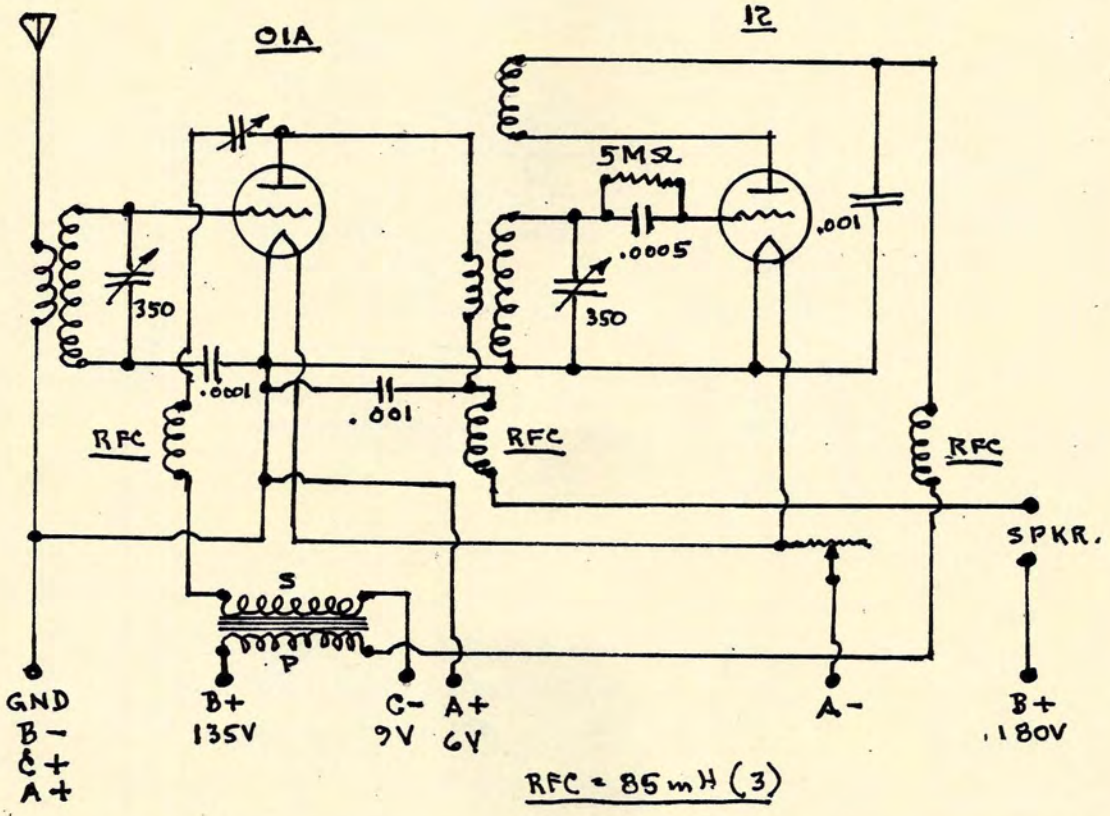
ERLA TWO-TUBE DUO-REFLEX
(1923)

(ERLA LIT.)

ERLA 2-TUBE REFLEX RCVR., 1923



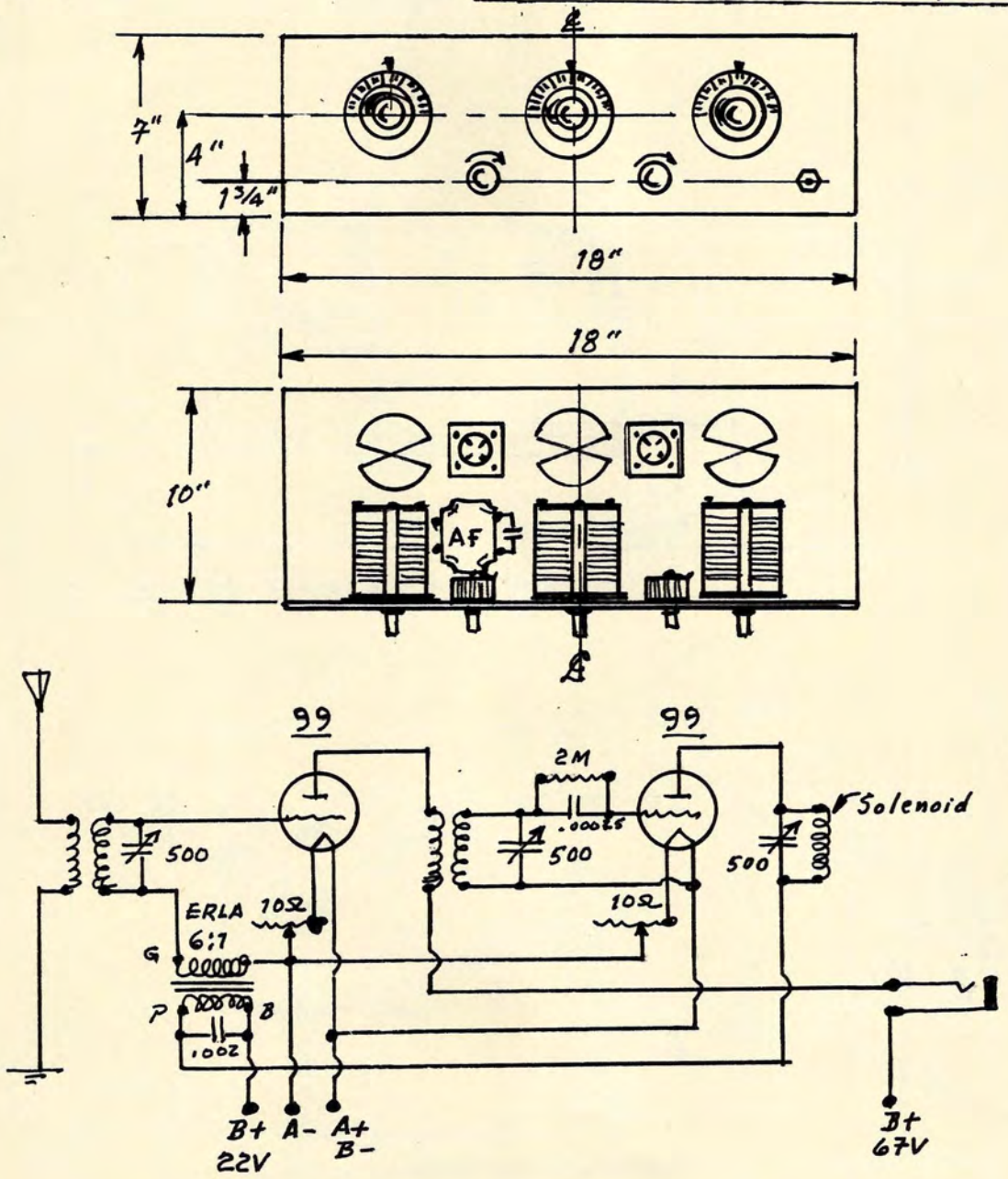
SAMSON 2-TUBE REFLEX RECEIVER, 1924



RFC = 85 mH (3)

(Sht. 1)

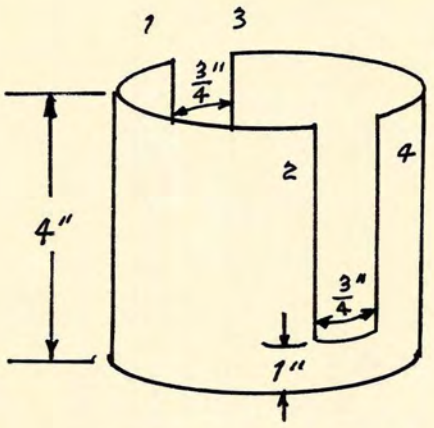
"TRANSCONTINENTAL" 2-TUBE REFLEX, 1924



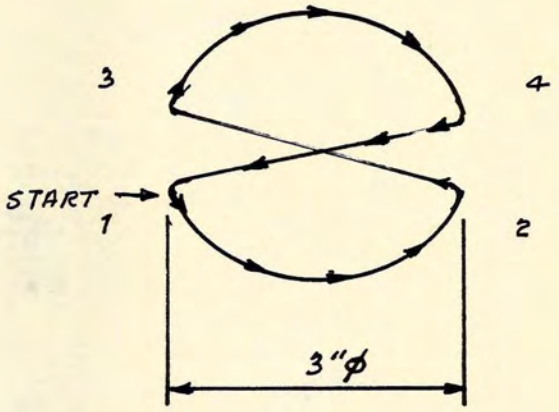
NOTE: If you wind your own coils, refer to Sht. 2. Otherwise, any D-Coils of the period may be used - except ACME.

(RW 1-31-25)

(Sht. 2) "TRANSCONTINENTAL" 2-TUBE REFLEX, 1924



CARDBOARD TUBE
(3 Required)



WINDING DATA: 1) 20T #24 DCC from bottom of slot, wound together w/ another length of #24 DCC wire. After 20T, which is the PRI, anchor the wire @ the bottom. Continue winding w/ the other wire 40 more turns for the SEC.

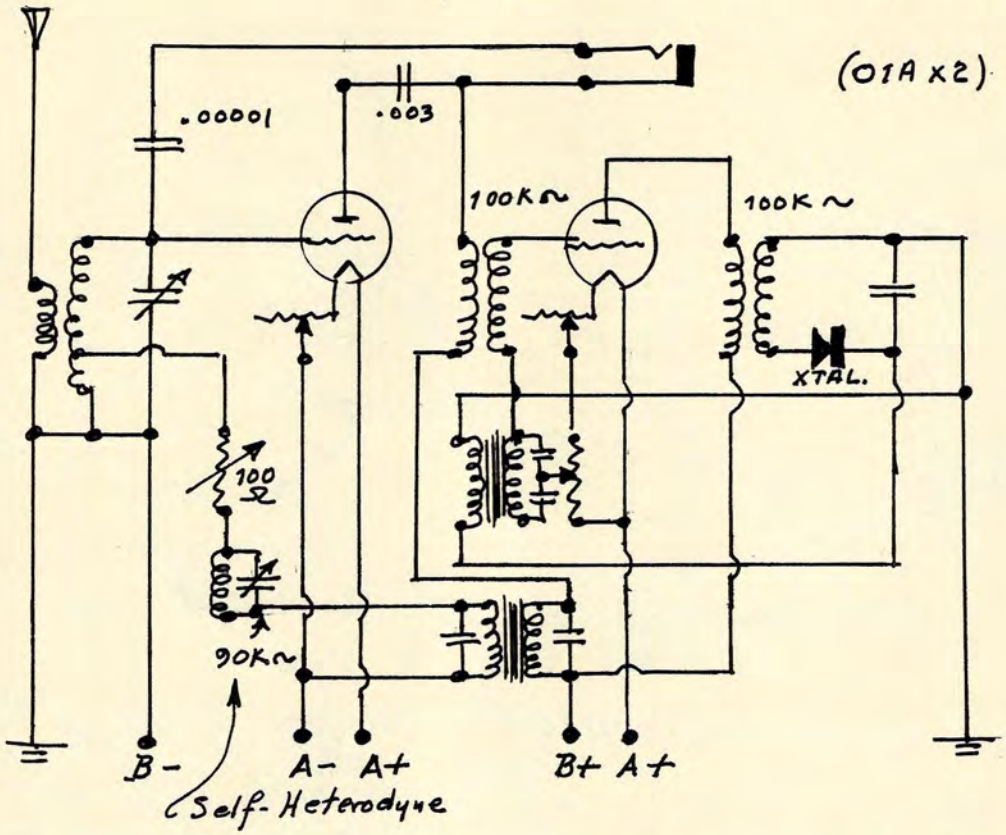
2) The 2nd RF coil has 12T as PRI, w/ 50T as SEC.

3) The solenoid coil has 55T.

NOTES: This kind of wiring was known as asatic, which was an early form of D-coil.

01As may be used but 99s are better for DX.

EDELMANN's "SUPERHETEROFLEX", 1923



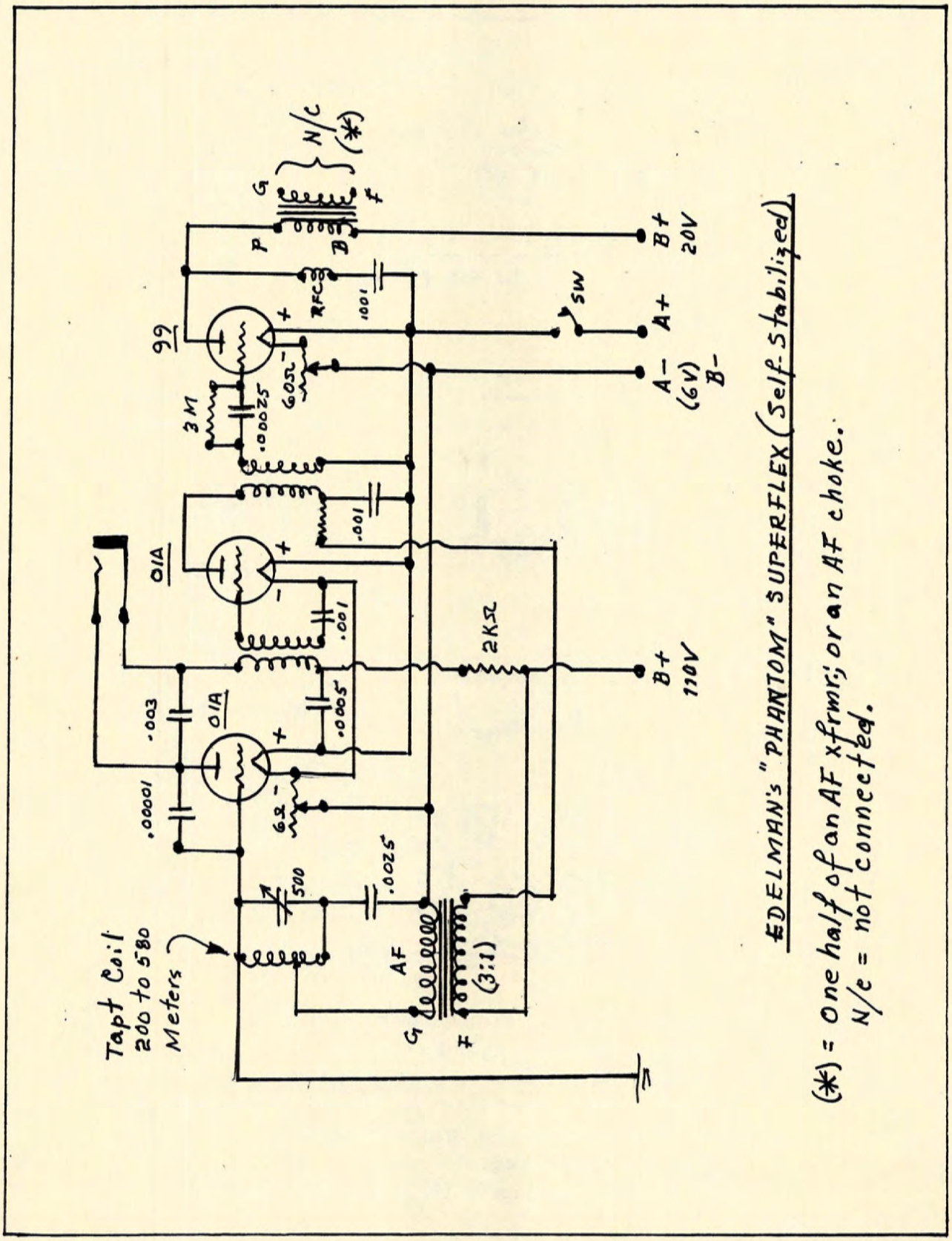
The 'secret' of this circuit was that one tube would amplify two different RF frequencies. Amplifying at RF frequencies increased the range of the set considerably, and AF distortion lessened.

99 tubes had a smaller output than the 01A, but were more sensitive on weak signals, although they could be easily over-ridden, that is - by a strong local signal.

Phillip Edelmann began operations in 1910 as a distributor of an impressive array of electrical and radio components, chiefly of his own design. These included variables, dials, coils, knobs, a wired panel or two, etc. After WWI he began designing circuitry, of a fairly original nature, and radio media of the time featur- several circuits by Edelman, none of which were exceptional.

His name, incidentally, in German means "Noble Man".

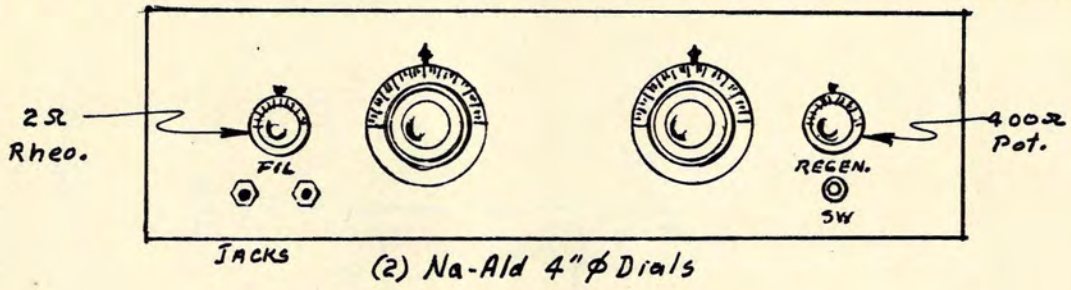
* * *

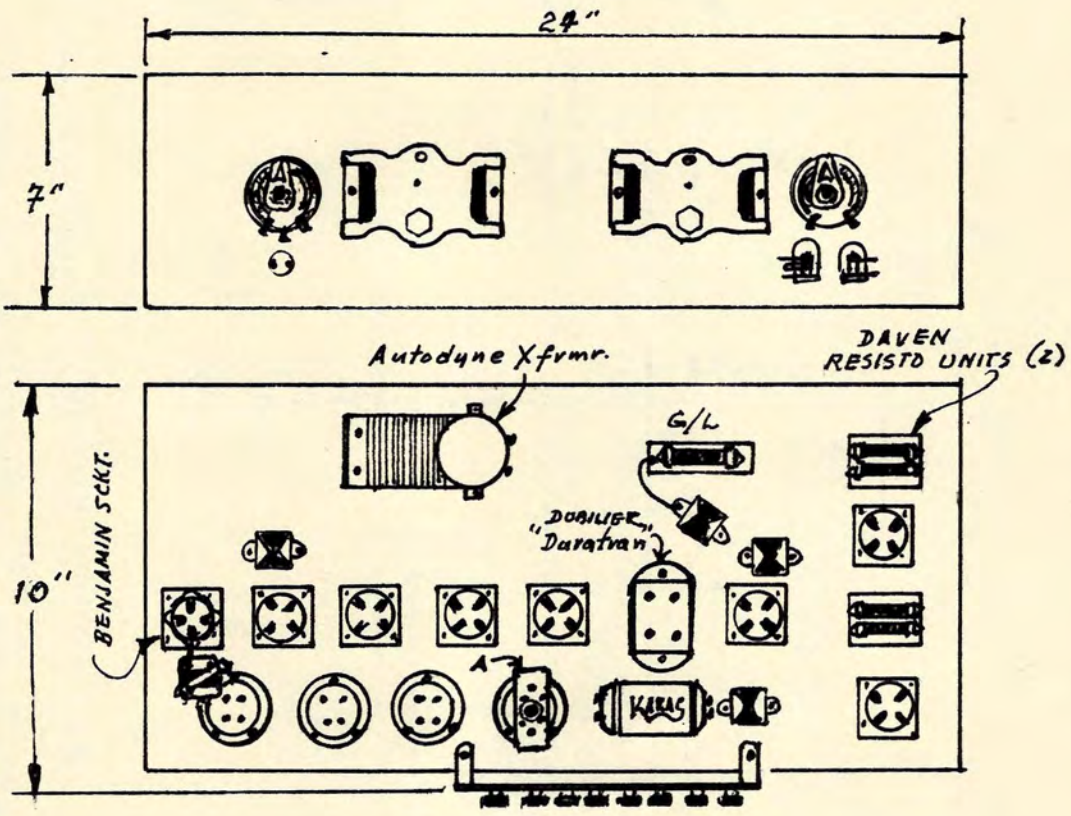


EDELMAN's "PHANTOM" SUPERFLEX (Self-Stabilized)

(*) = One half of an AF xfrmr; or an AF choke.
N/c = not connected.

(Sht. 1) COCKADAY SUPER-HET REFLEX 8-TUBES, 1924



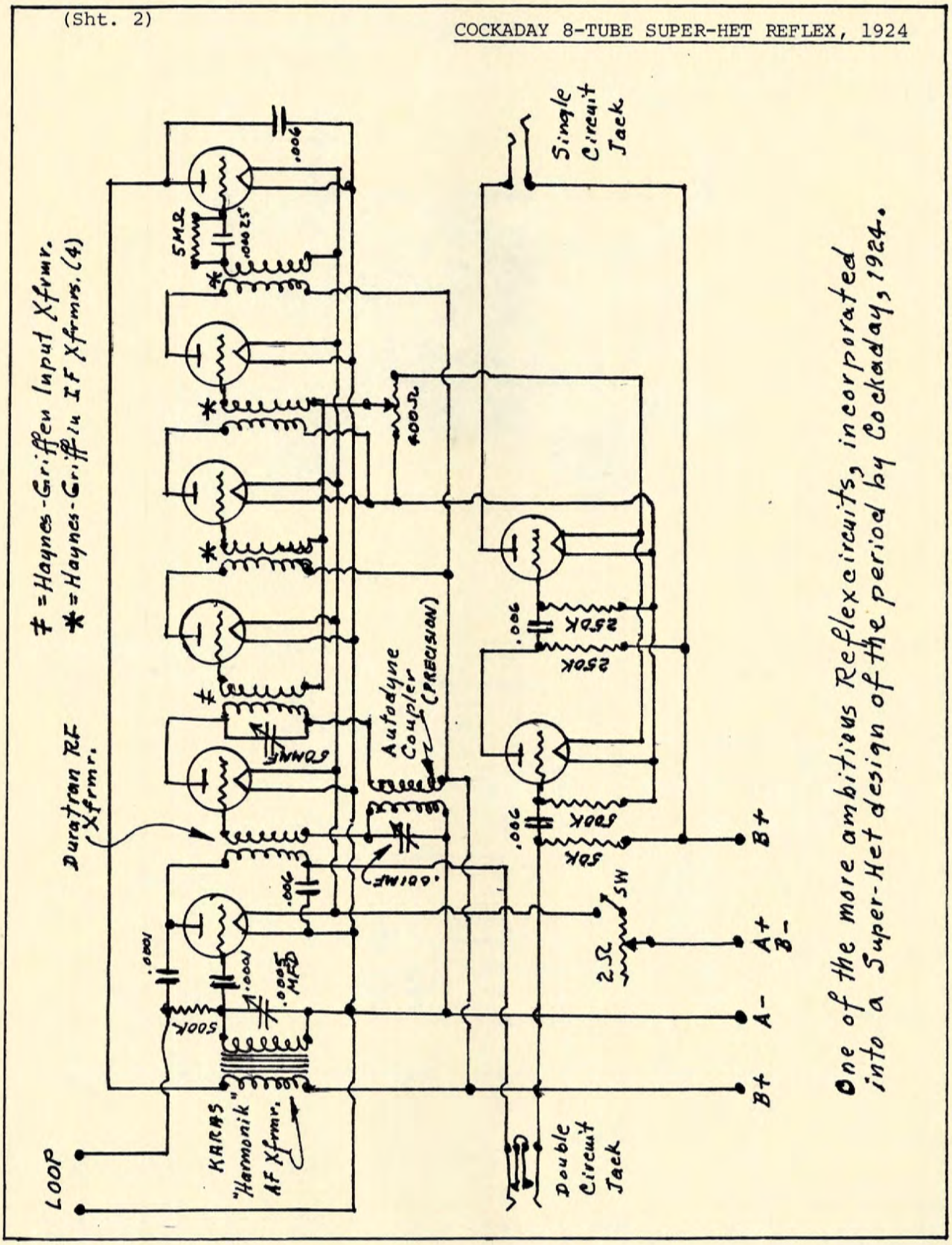


NOTES: FEDERAL SCKTS. UNLESS NOTED. (7)
GENERAL INSTRUMENT Variables.
A = AMPLEX "Grid-Denser", 50 mmf max.
Feed-back prevented by means of the FARRAND method, known as the "Pliodyne".
2nd Harmonic used.
IF Xfrmrs. operate @ 2,200 Meters.

(PR 1-25)

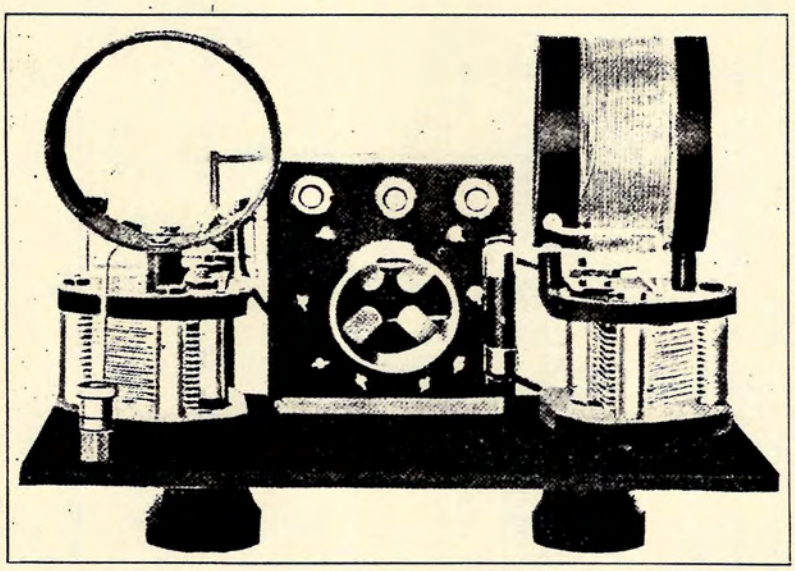
(Sht. 2)

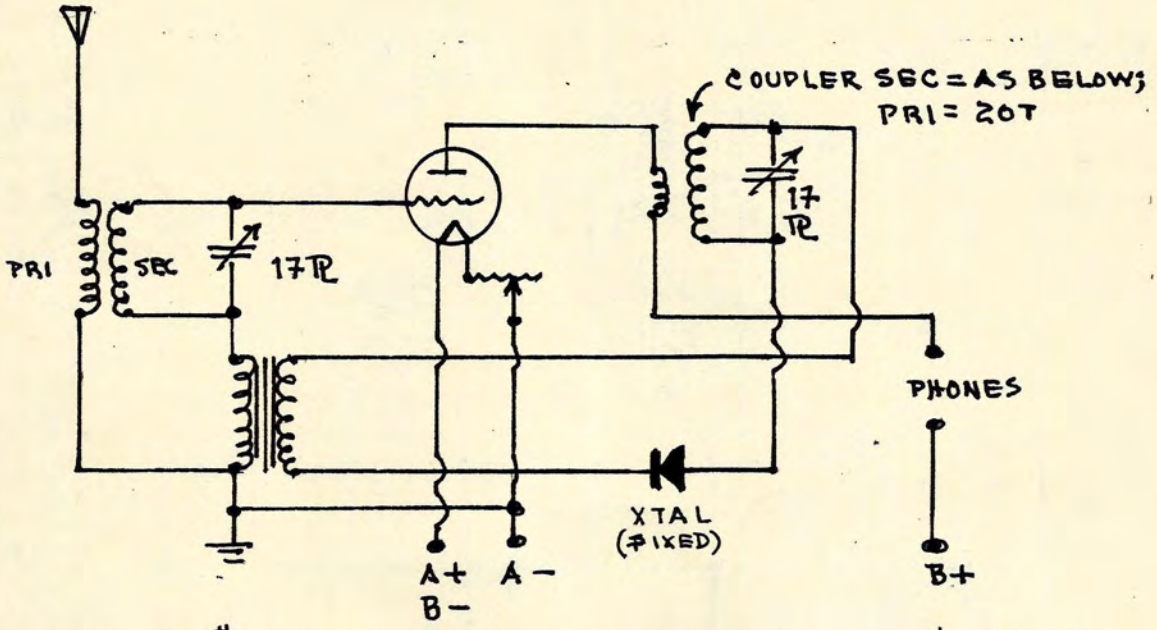
COCKADAY 8-TUBE SUPER-HET REFLEX, 1924



One of the more ambitious Reflex circuits, incorporated into a Super-Het design of the period by Cockaday, 1924.

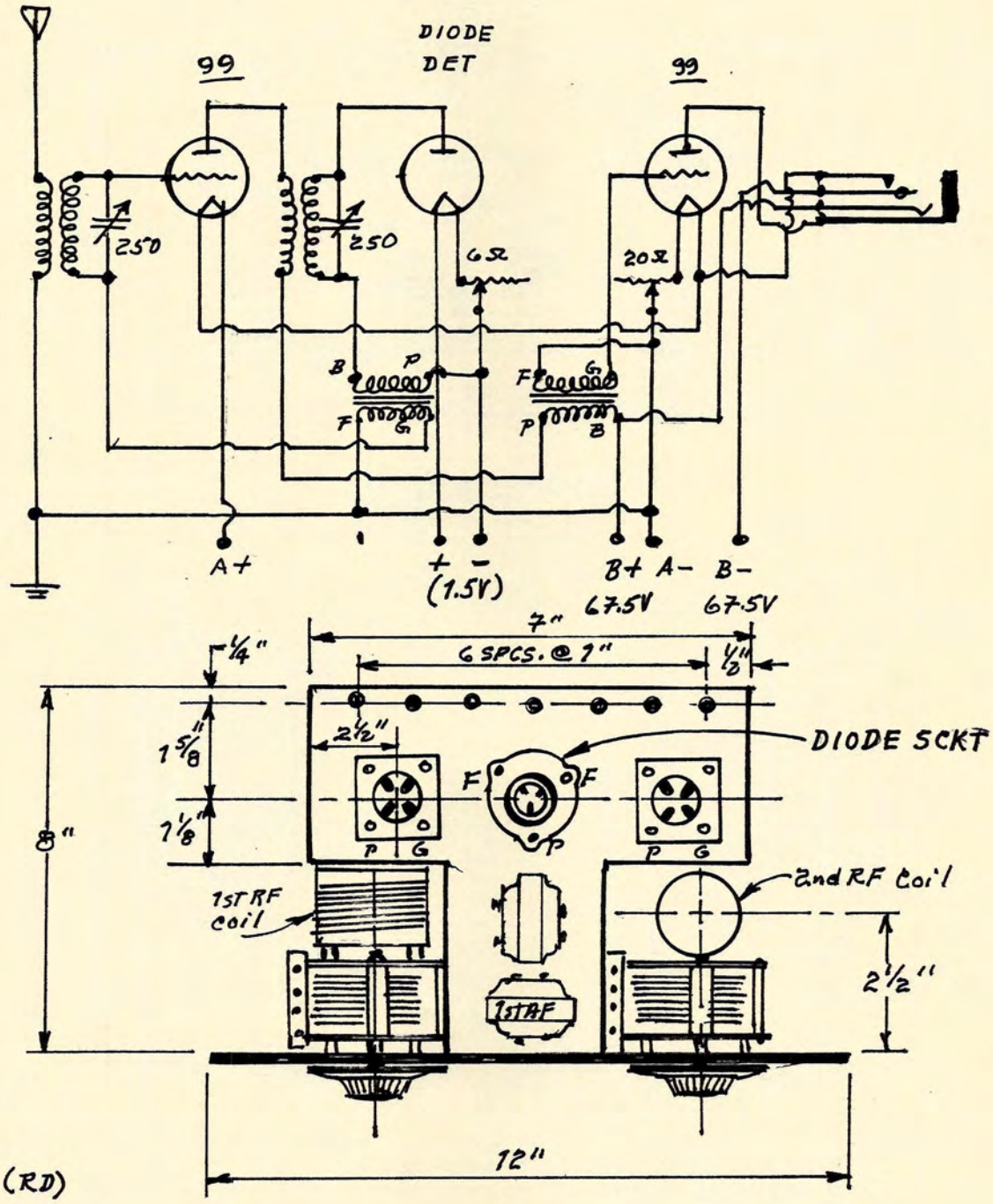
HARKNESS ONE-TUBE REFLEX, 1923



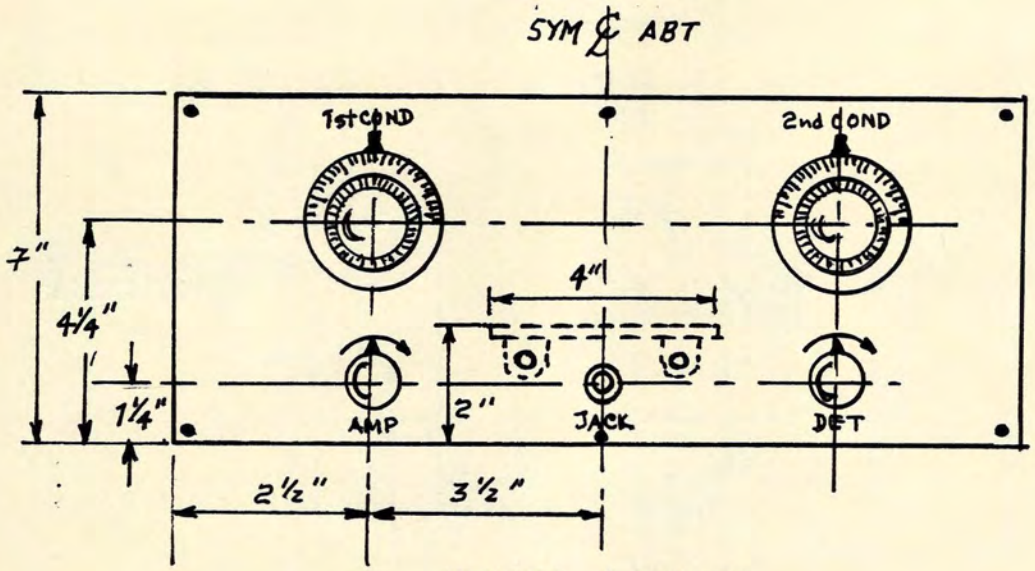


SEC = 55T, # 24 SCC, 3" ø FORM. PRI = 15T OVER SEC & CAMBRIC

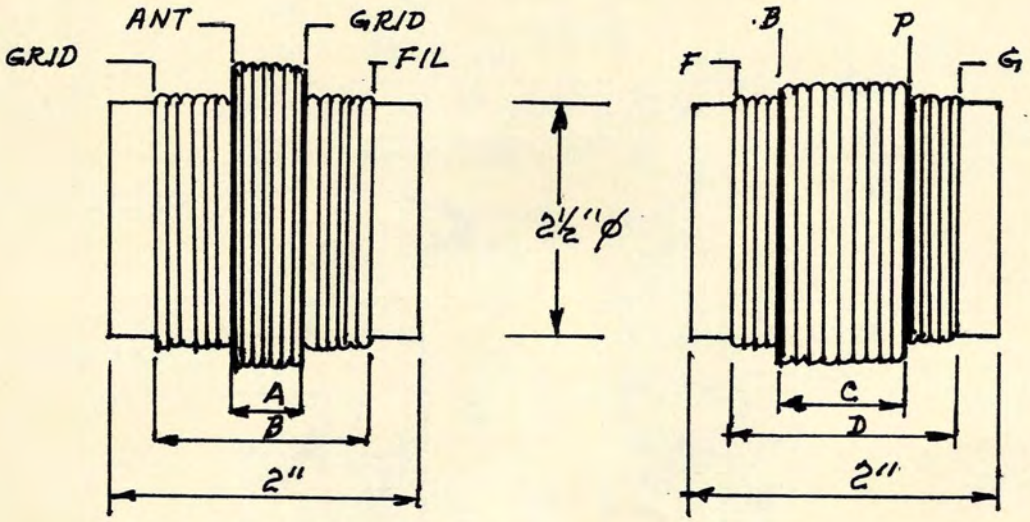
HARKNESS 3-TUBE REFLEX, 1924; Sht. 1



HARKNESS 3-TUBE REFLEX, 1924; Sht. 2



PANEL LAYOUT



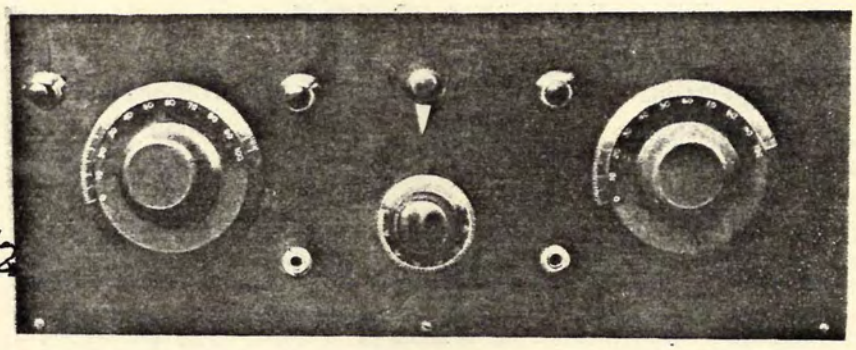
A = 20T, # 24 SSC.
B = 80T, " " .
C = 60T, " " .
D = 80T, #24 SSC.

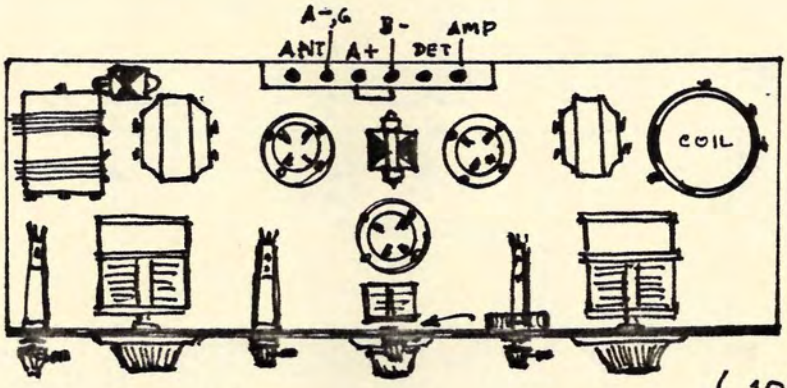
1st RF COIL

2nd RF COIL

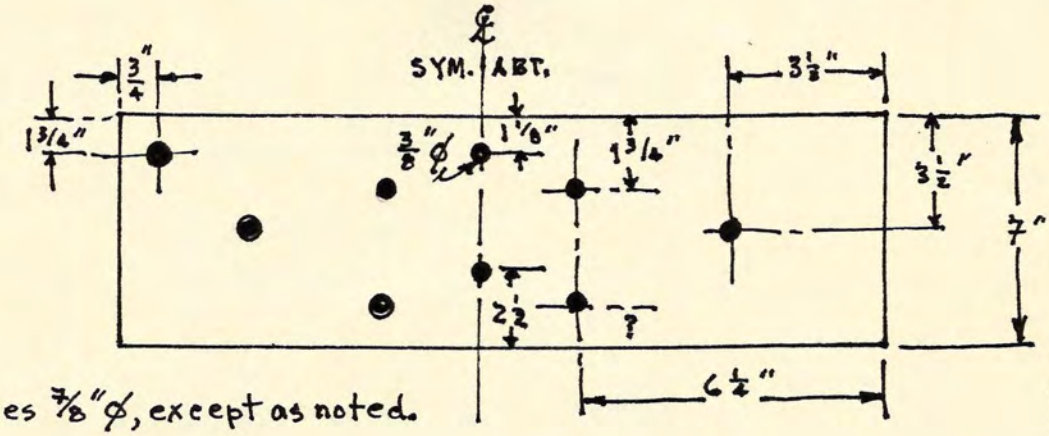
HARKNESS "COUNTERFLEX" 1924/1925;Sht.1

7"x18"x 3/16" 2



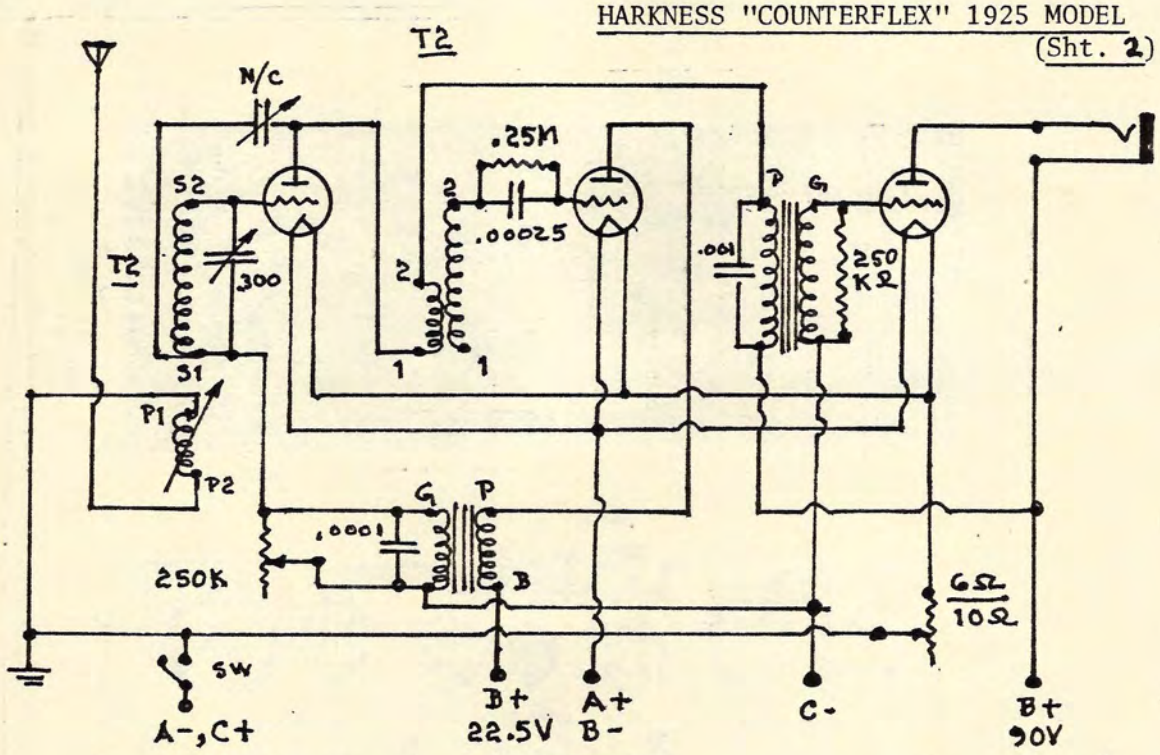


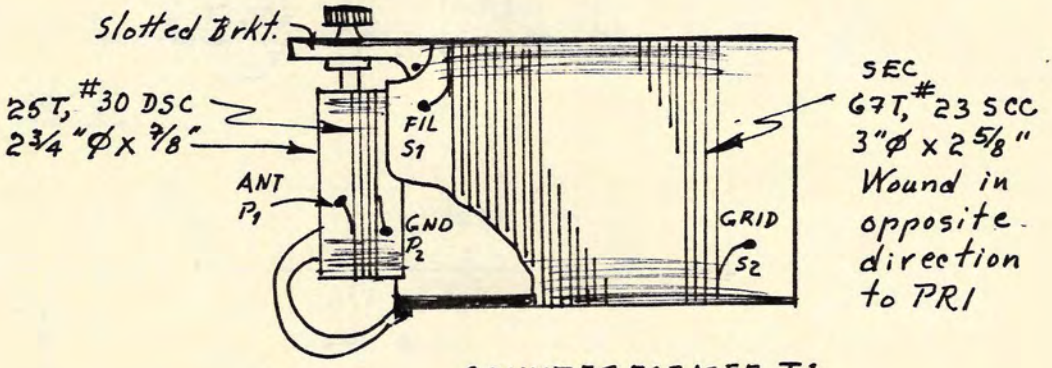
(1924)



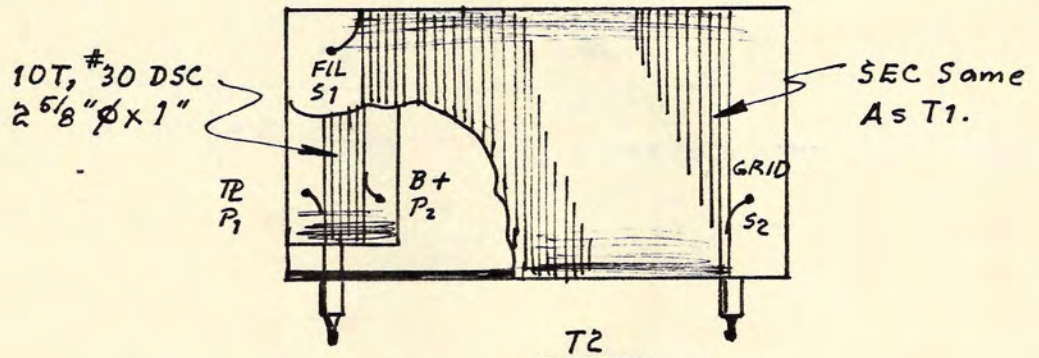
All holes 3/8" ø, except as noted.

HARKNESS "COUNTERFLEX" 1925 MODEL
(Sht. 2)



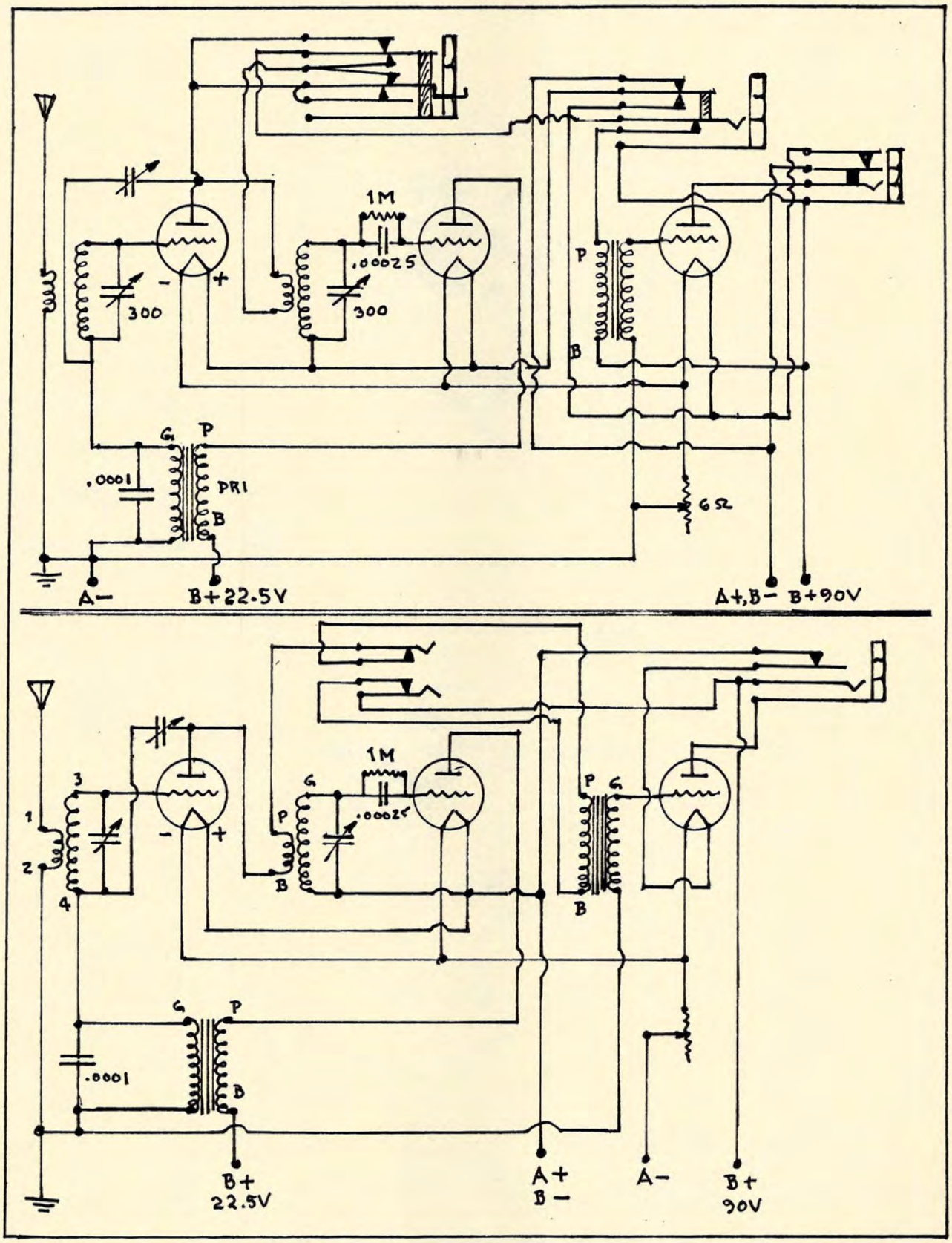


COUNTERFORMER T1

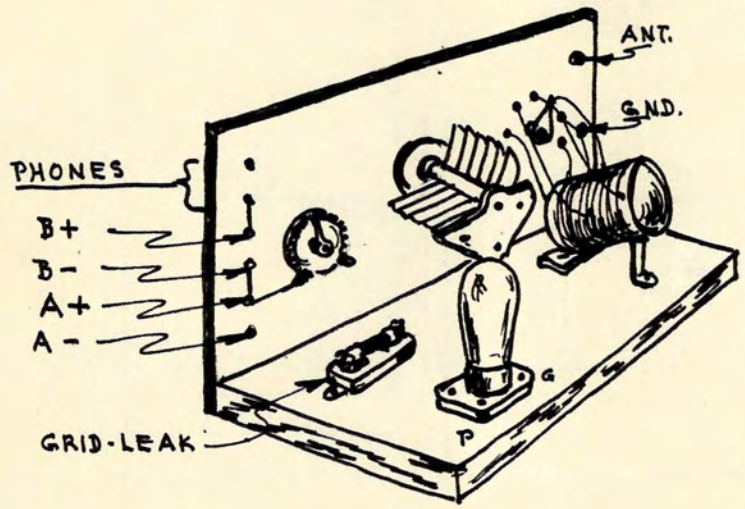


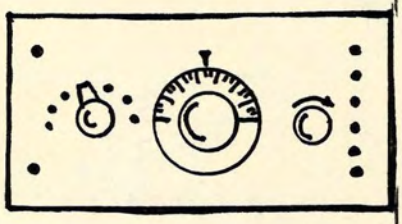
T2

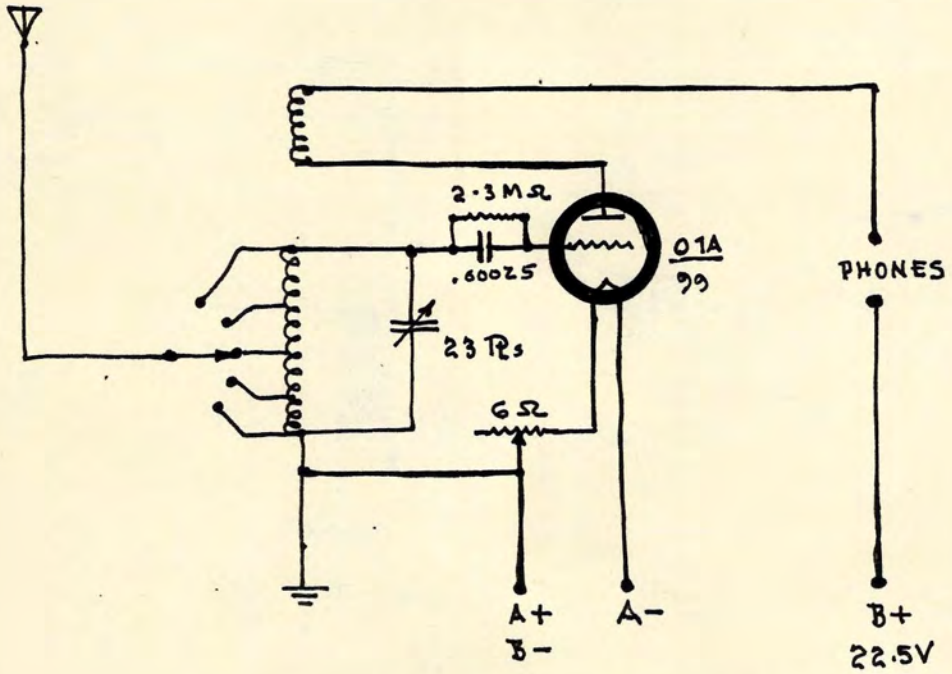
HARKNESS "COUNTERPHONIC" VARIANTS



HAYNES REFLEX RECEIVER, 1924

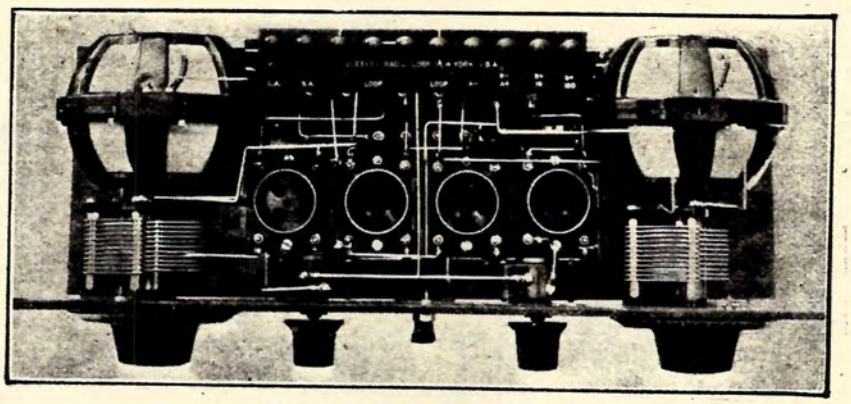




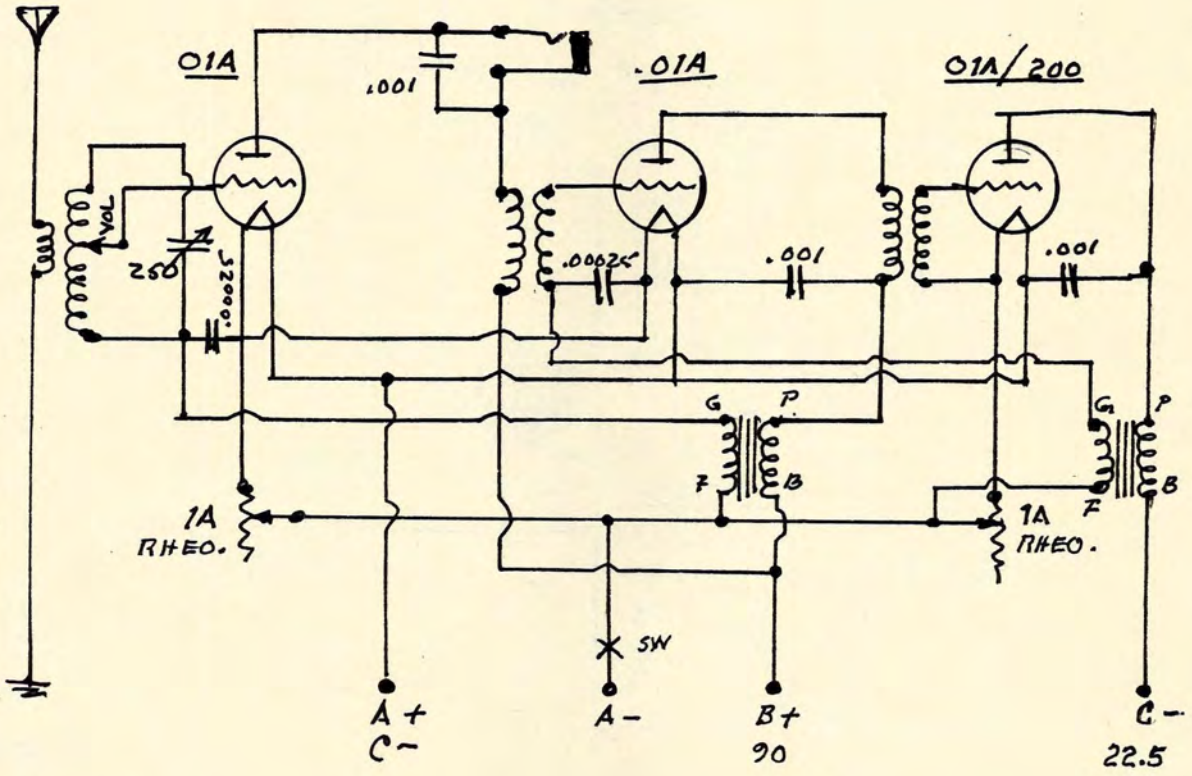


PANEL = 6" x 8" x $\frac{3}{16}$"
BASEBOARD = 6" x 8" x .75"
GRID-LEAK = Cut-&-Try.

GRIMES' "INVERSE DUPLEX", 1923 VERSION

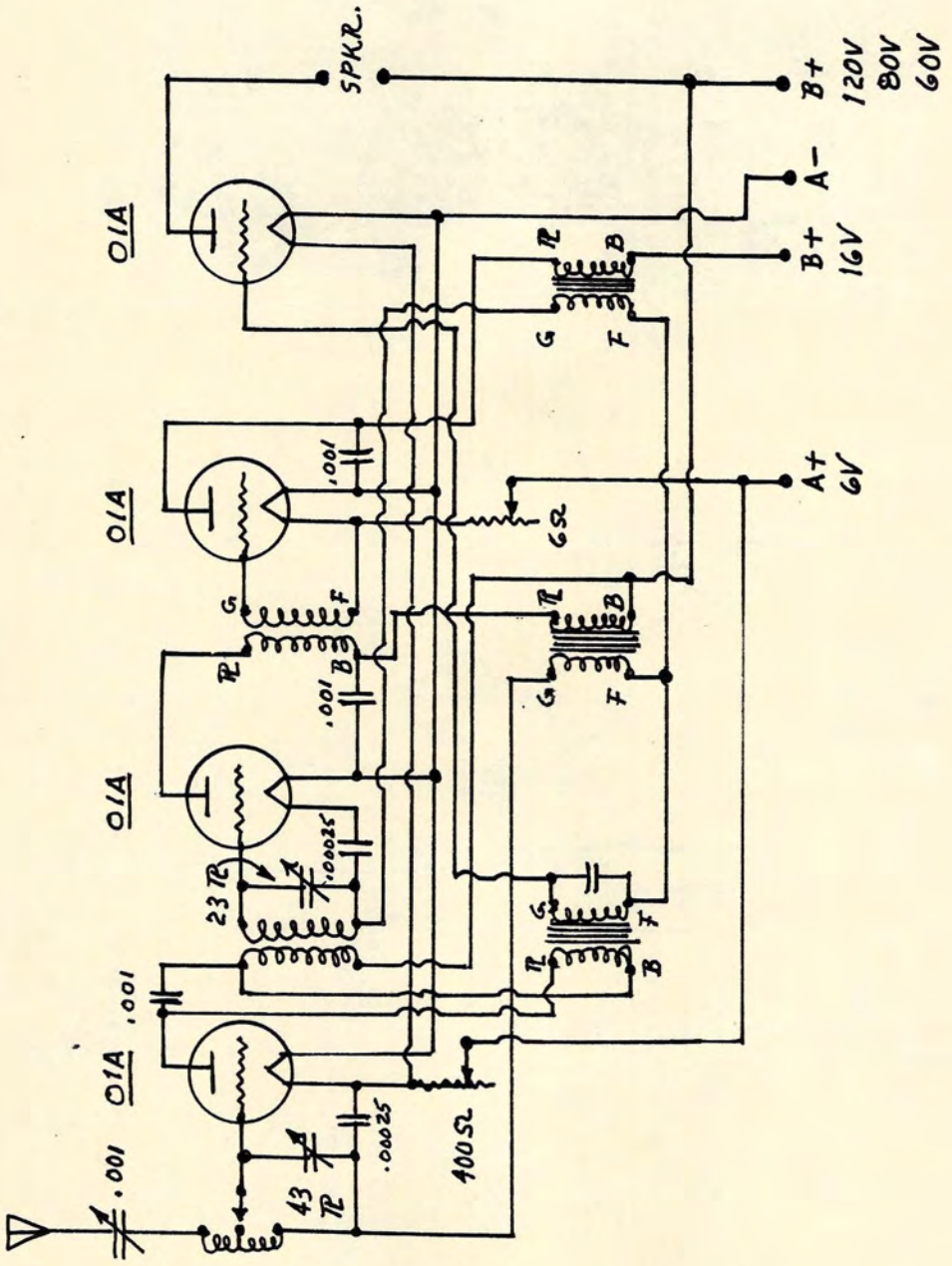


(1925 LAYOUT SHOWN)



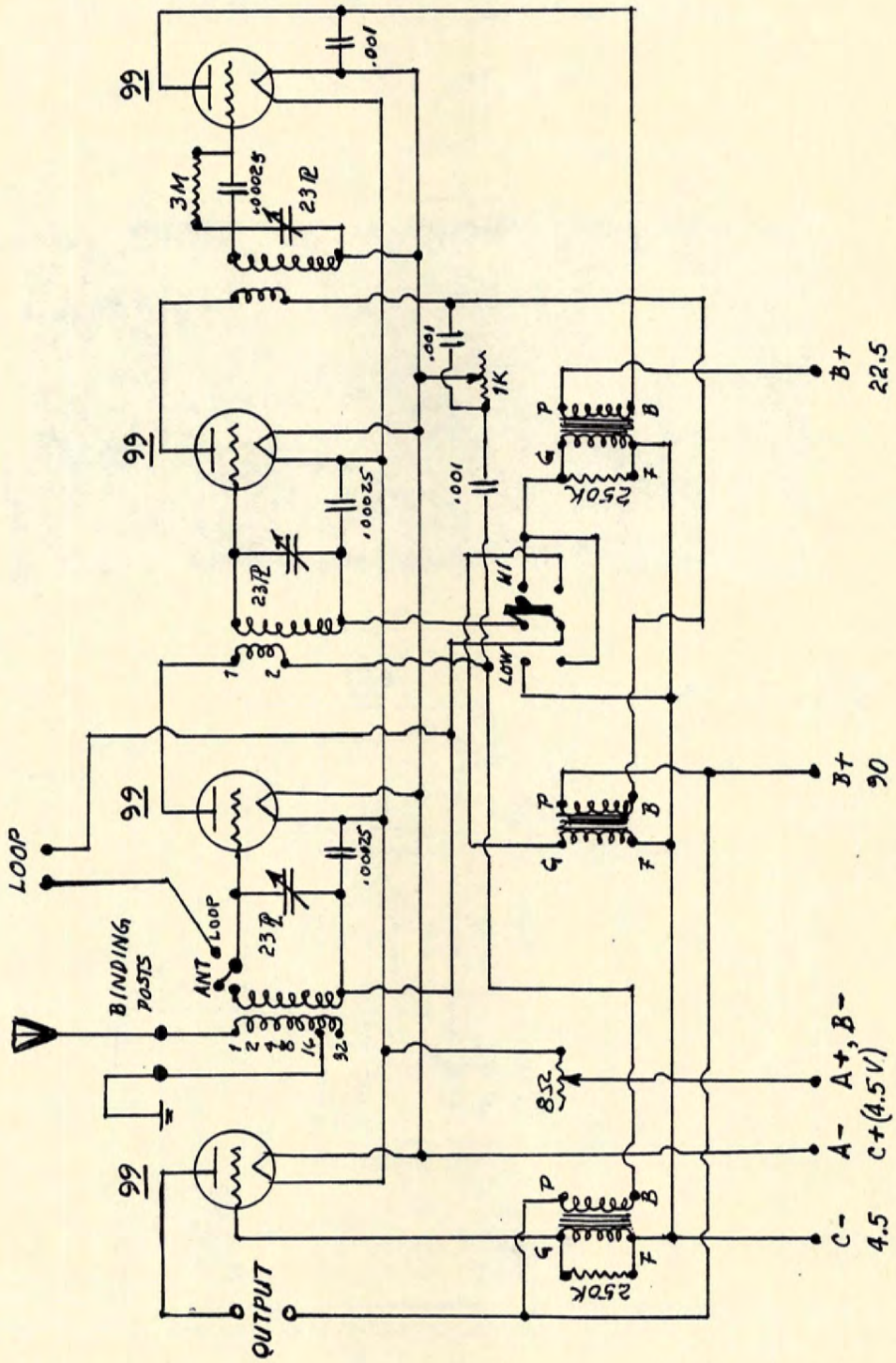
(R 1·24)

GRIMES ORIGINAL "INVERSE-DUPLEX", 1924



(R 3/4-24)

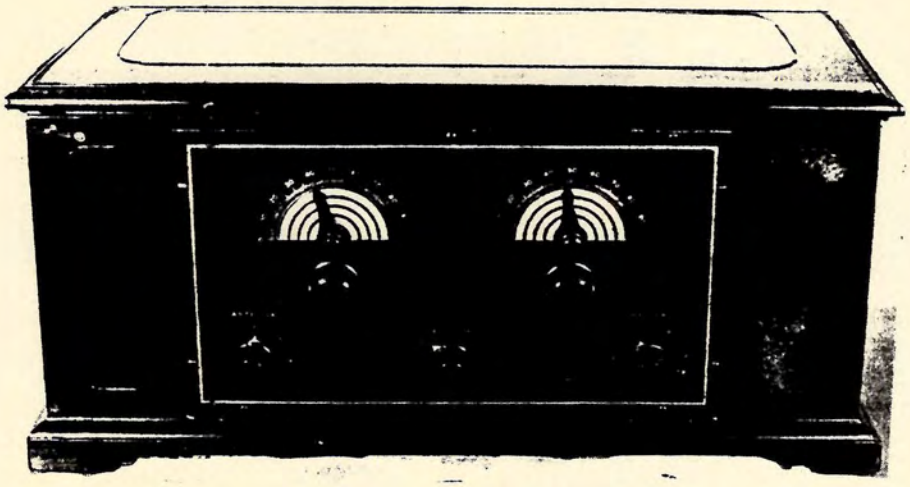
GRIMES "INVERSE DUPLEX" of 1925

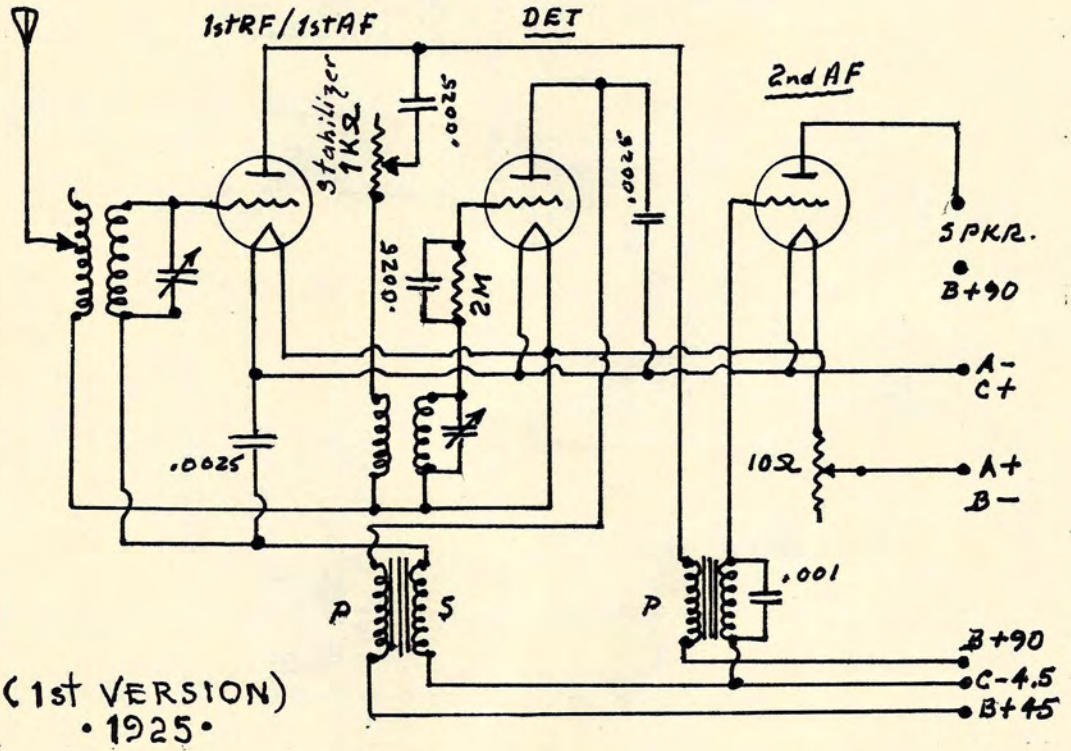


(Sht.1)

David 1 EQUALS 2 Grimes

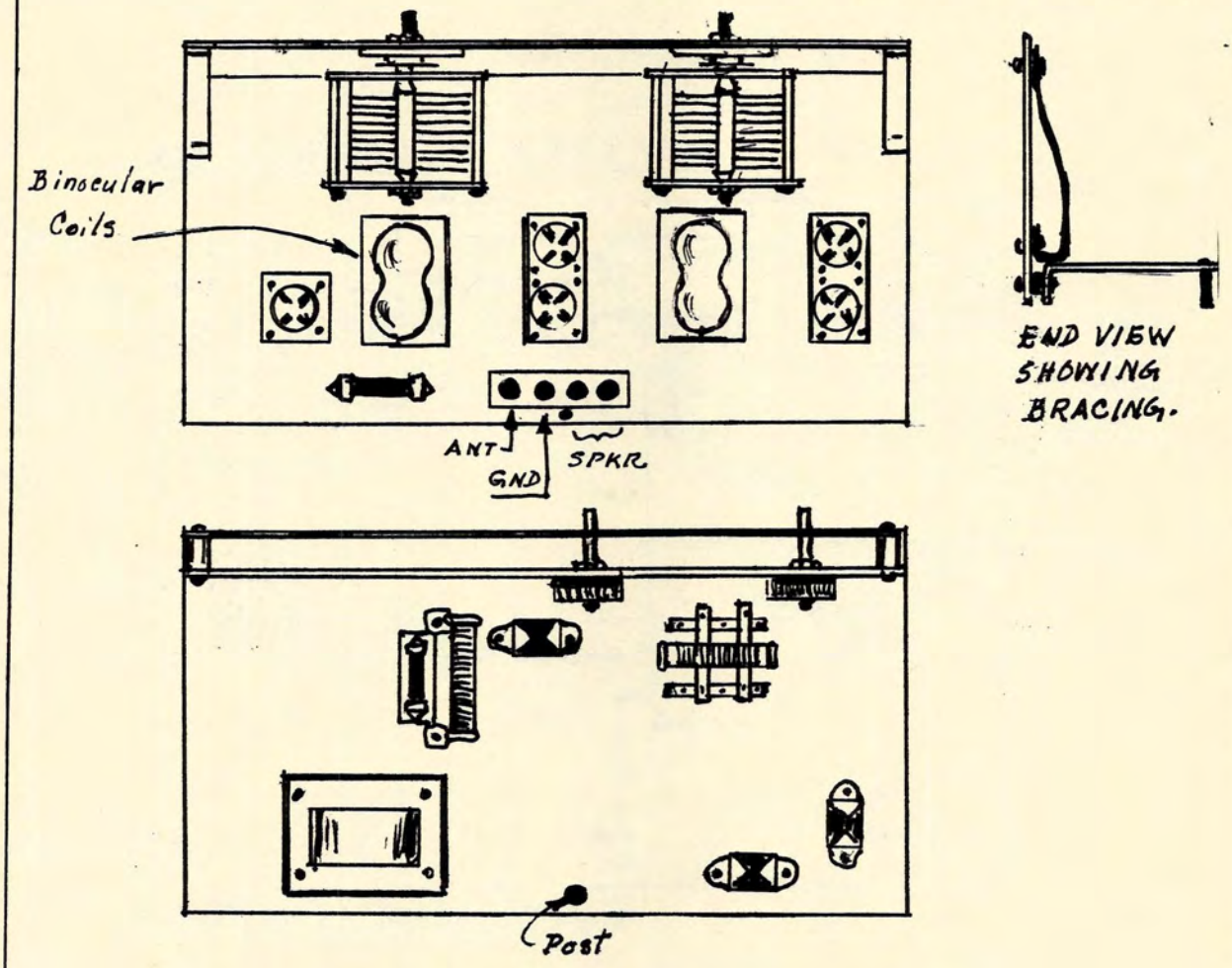
"Baby Grand"





(1st VERSION)
•1925•

GRIMES' "BABY GRAND" RCVR.: Sht. 2

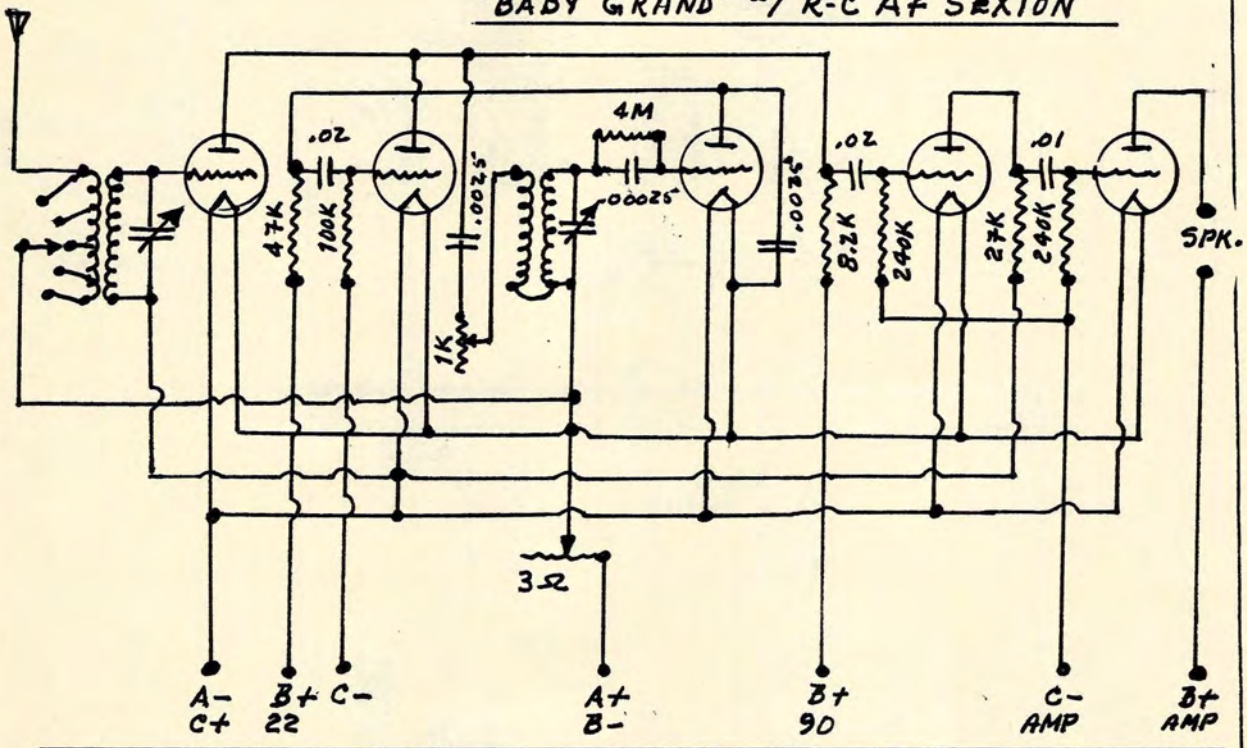


BOTTOM VIEW

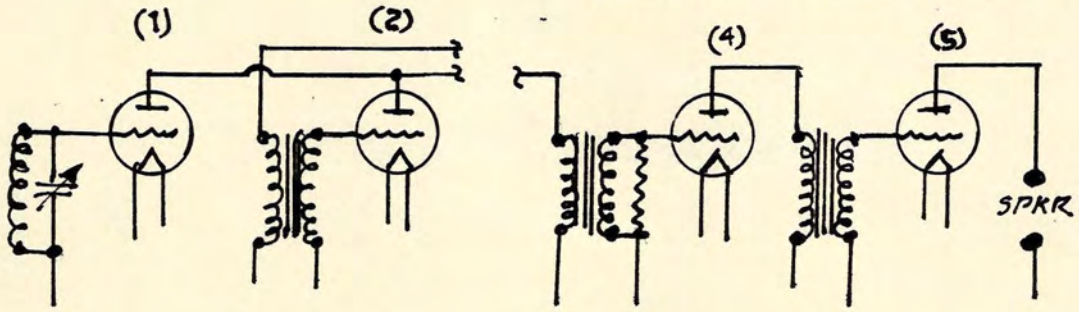
(XFRMR.-CPLD. AF VERSION SHOWN.)

(Sht: 3)

"BABY GRAND" W/ R-C AF SEXION

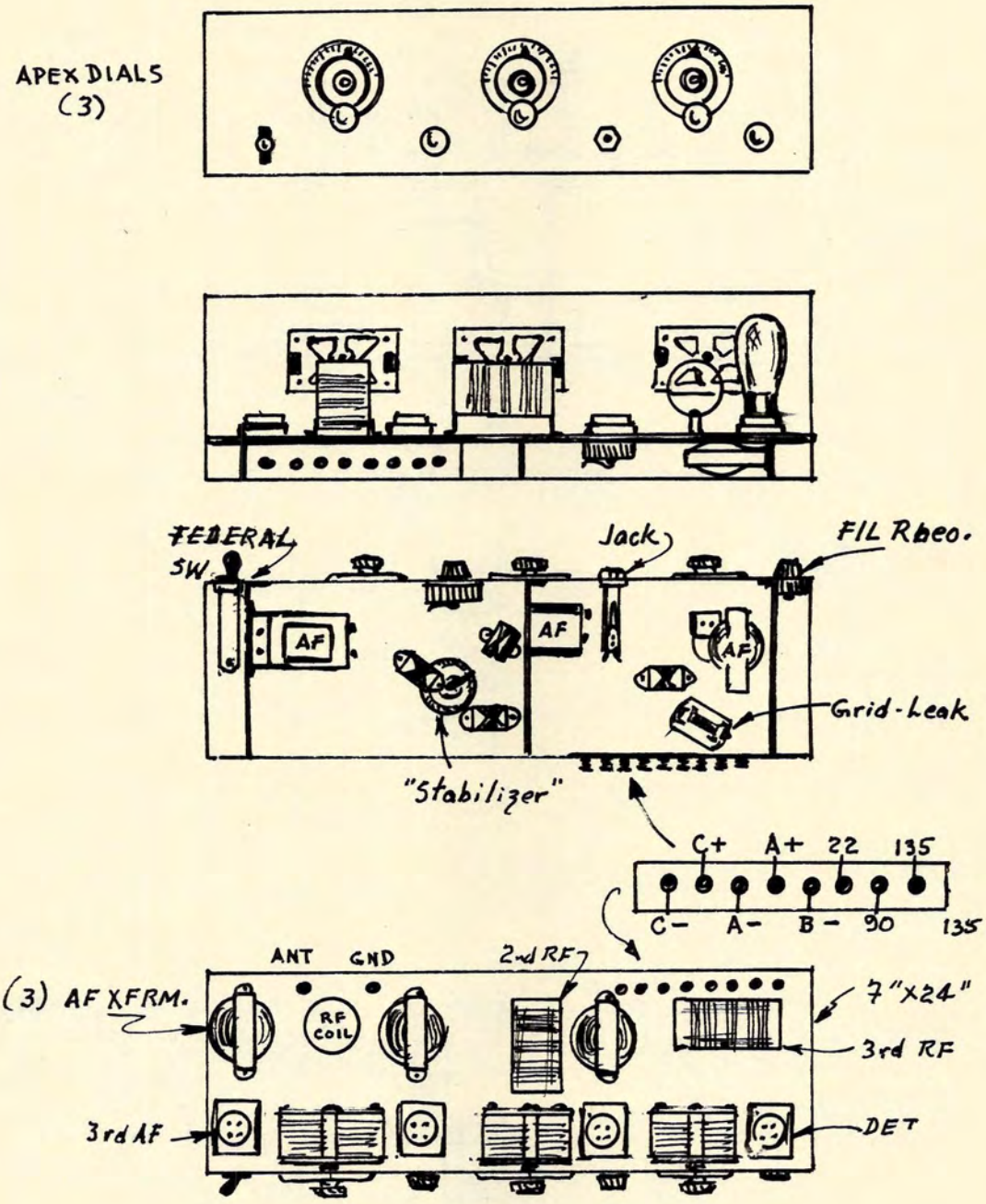


W/ XFRMR. AUDIO SEXION



(Circuitry not shown same as above.)

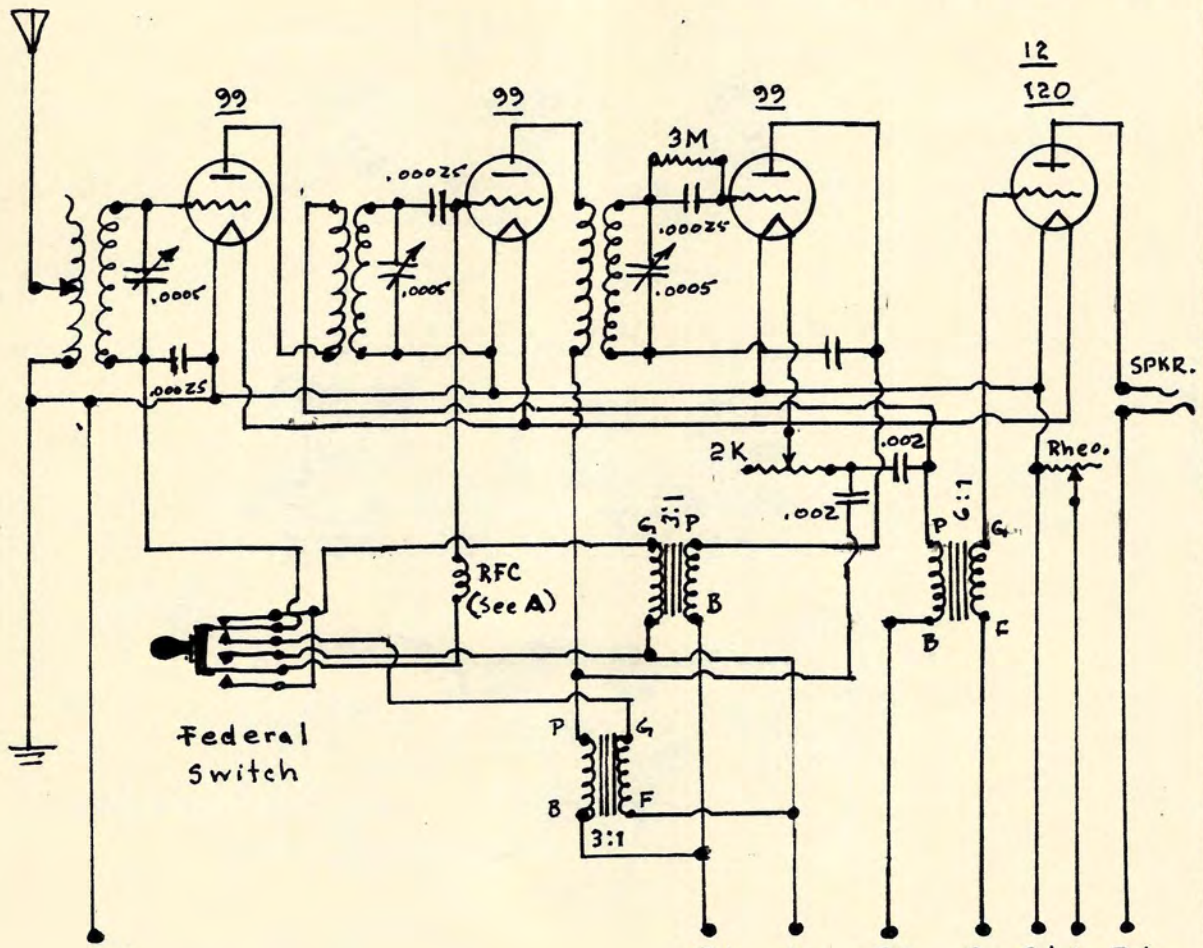
"INVERSE-DUPLEX" VARIANT, 1926; Sht. 1

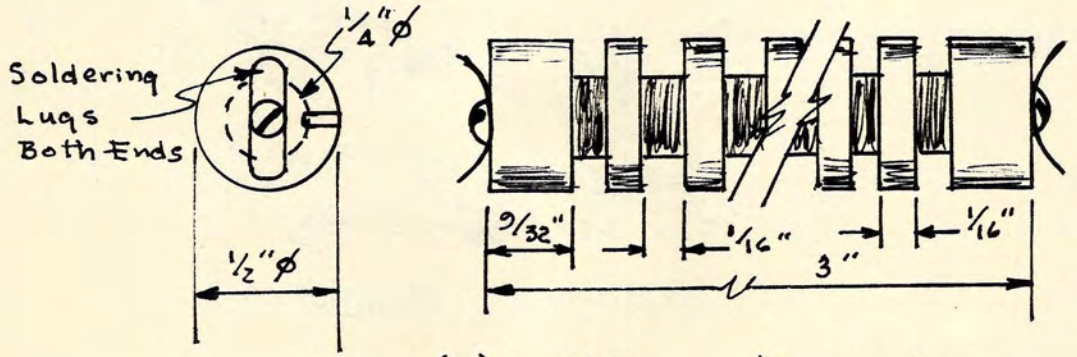


LAYOUT FOR A BASEBOARD

(RN 4-26) $40

"INVERSE-DUPLEX" VARIANT, 1926; Sht. 2

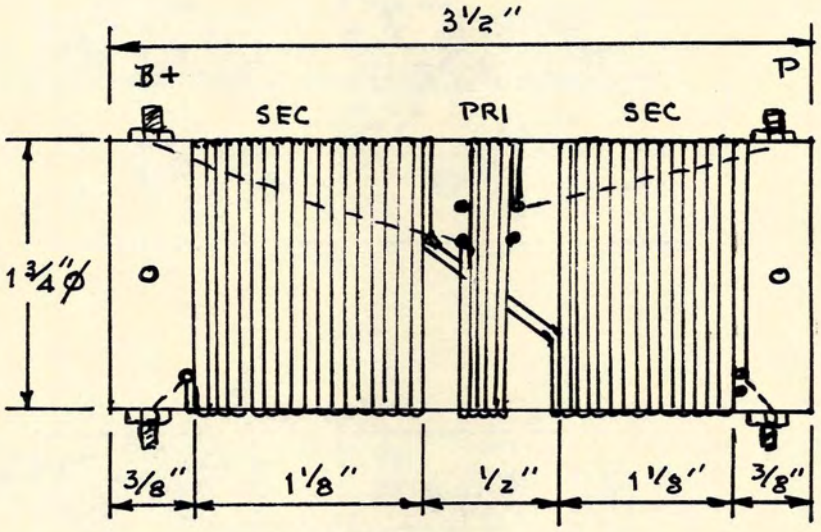


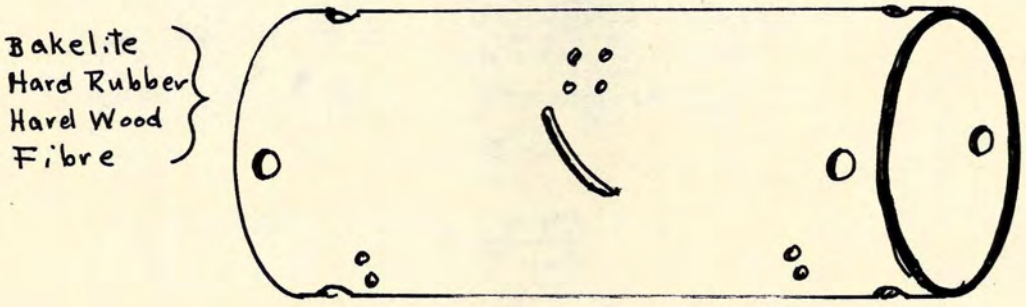


(A) = RFC

#36 DCC Filling
Each Slot

"INVERSE-DUPLEX" VARIANT, 1926; Sht. 3



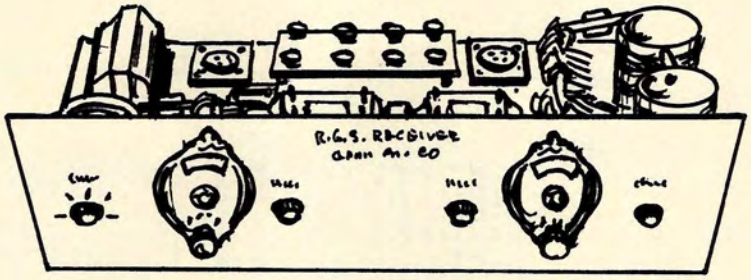


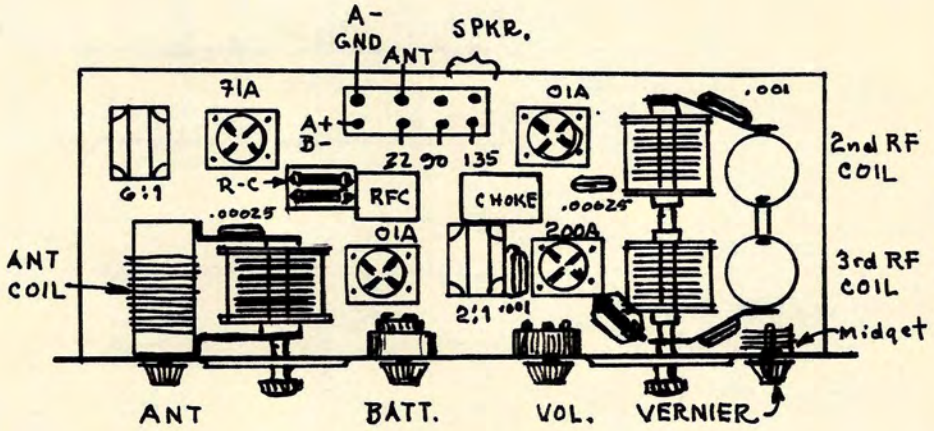
(2) RF TRANSFORMER DETAILS

PRI = 15T, #32 or #34 DCC
SEC = 90T, #28 DCC

ANT COIL = PRI 25T, #32 DCC, Tapt @ 2T, 4T, 8T, 15T, 25T.
SEC = Same as RF coils.

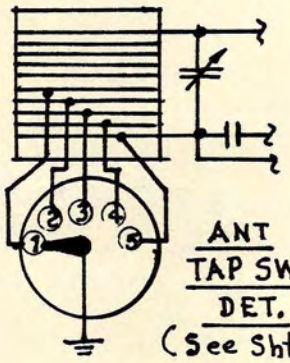
GRIMES "R.G.S." INVERSE-DUPLEX; 1927: Sht.1





PLAN VIEW~ 2nd VERSION
(See Sht. 3 for 1st Version)

Supplied in Kits, both versions, by GRIMES RADIO CO.

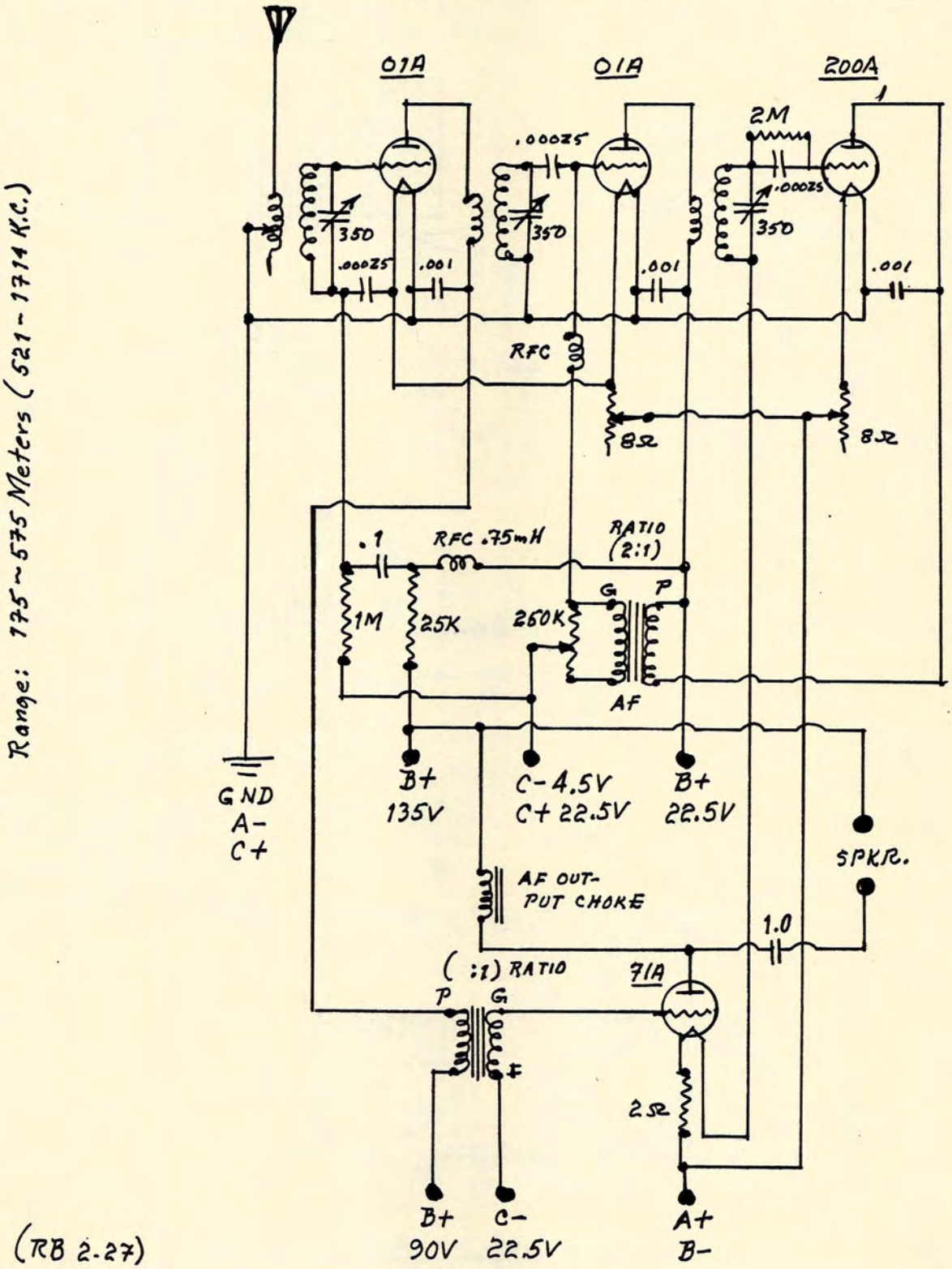


ANT
TAP SW.
DET.
(See Sht.3)

NAT'L. Single & Dual Variables
NAT'L. Dials
SAMSON AF X frmrs.
DeJUR R-C unit w/Cap.
GRIMES RFC & CHOKE.
GRIMES RF COILS.
Hardware & Components
as required, any make.

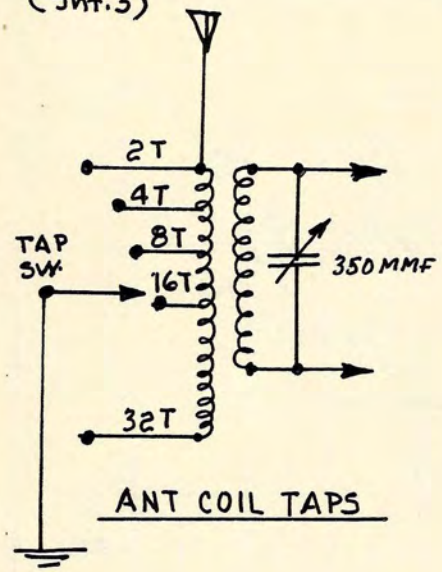
(RB 1/2/3-27)

GRIMES "R.G.S." INVERSE-DUPLEX; 1927: Sht.2

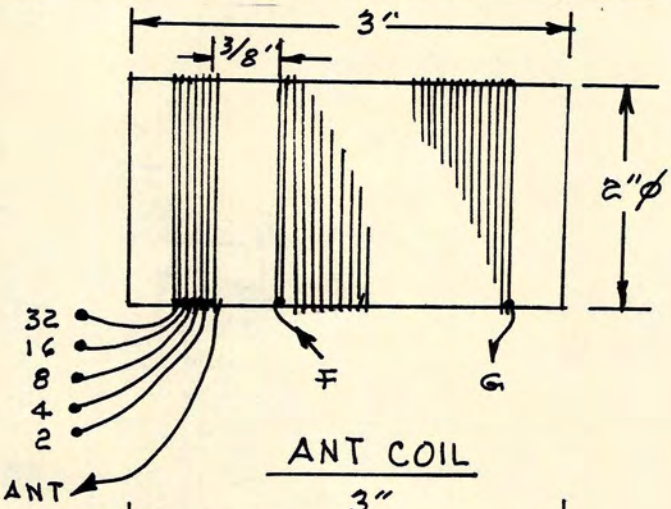


GRIMES "R.G.S." INVERSE-SUPLEX; 1927

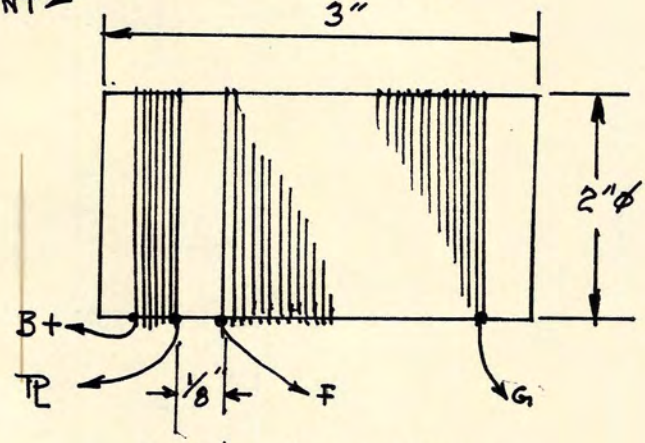
(Sht.3)



ANT COIL TAPS



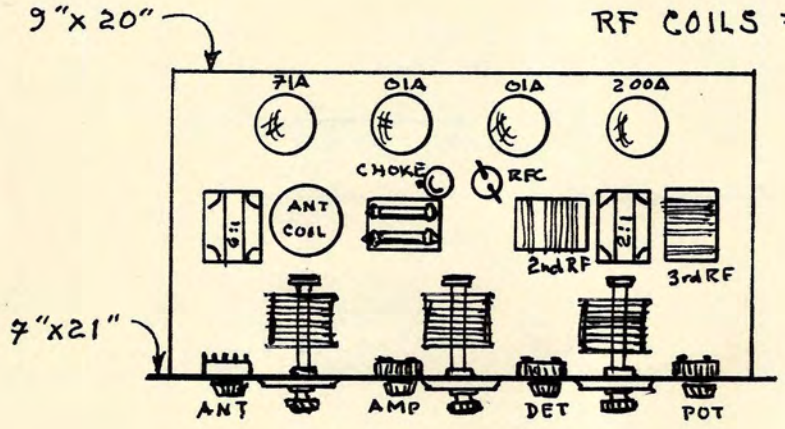
ANT COIL



2nd & 3rd RF COILS

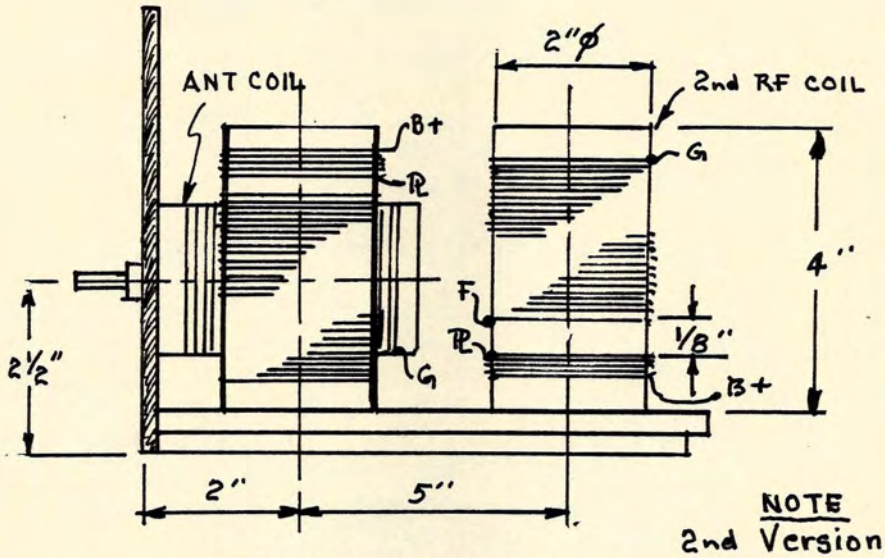
ANT COIL = PRI 32T, #30 DSC
SEC 92T, #28 DCC

RF COILS = PRI 9T, #28 DCC
SEC 92T, #28 DCC



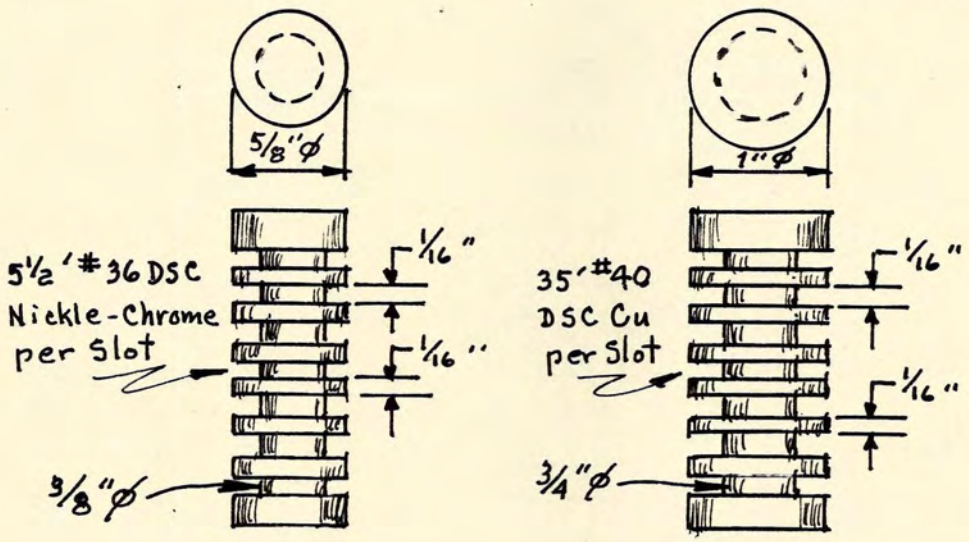
PLAN VIEW; FIRST VERSION

GRIMES "R.G.S." INVERSE-DUPLEX;1927:Sht.4



COIL PLACEMENT

NOTE
2nd Version of 2nd RF Coil Went to 90T on SEC. Other Coil Data Remains As Shown on Sht. 3.



RFC

RF GRID CHOKE

COIL DATA

(Sht. 5) GRIMES "R.G.S." INVERSE-DUPLEX, 1927

OPERATING INSTRUCTIONS

1. No two circuits require the same tuning adjustments.

2. Selectivity, distance, tone quality depend exclusively on the position of the ANT switch. No other control is as important or as critical.

3. The ANT electrically shortens or lengthens the antenna.

4. The associated variable must be altered with each change in position of the ANT switch.

5. Stations between 750-1000 KC. are best received when the ANT switch is placed at Position 3. For stations between 1000-1500 KC., Position 1 or 2 is best. Tap Position 3 is a good spot for initial tuning. Position 4 is used for the 600 KC. range.

6. VOL control should be left at between ¼ and ½ on.

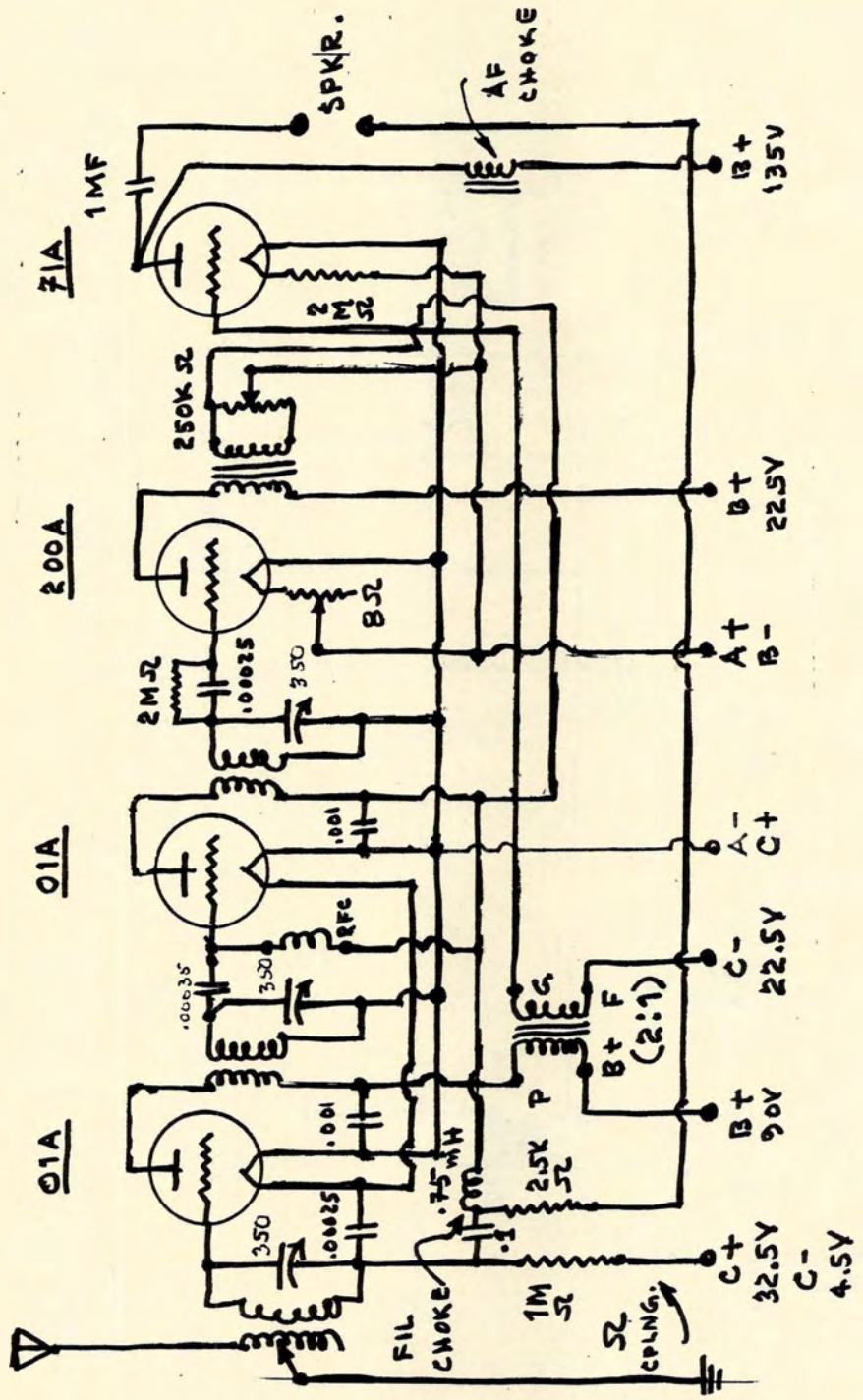
7. The 2-ohm rheostat regulates all FIL current. It also acts as a cut-off switch in the OFF position. FIL voltage should be held as close to 5V as possible.

8. Shortening the antenna will bring the proper setting of the ANT variable to approximately the setting of the dual variable for any special station.

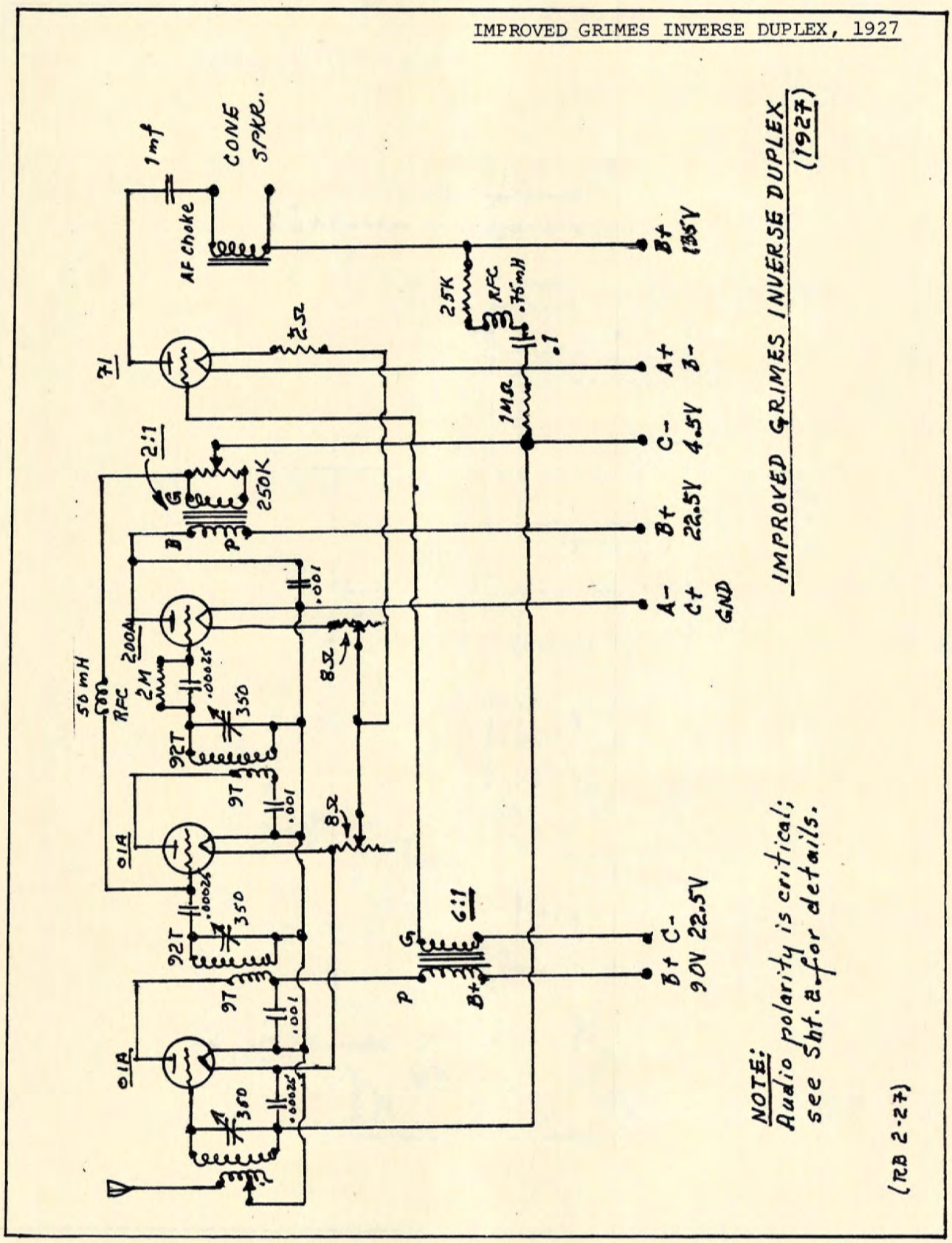
9. Once a signal is tuned in, the dual variable is rocked for best fidelity.

* * *

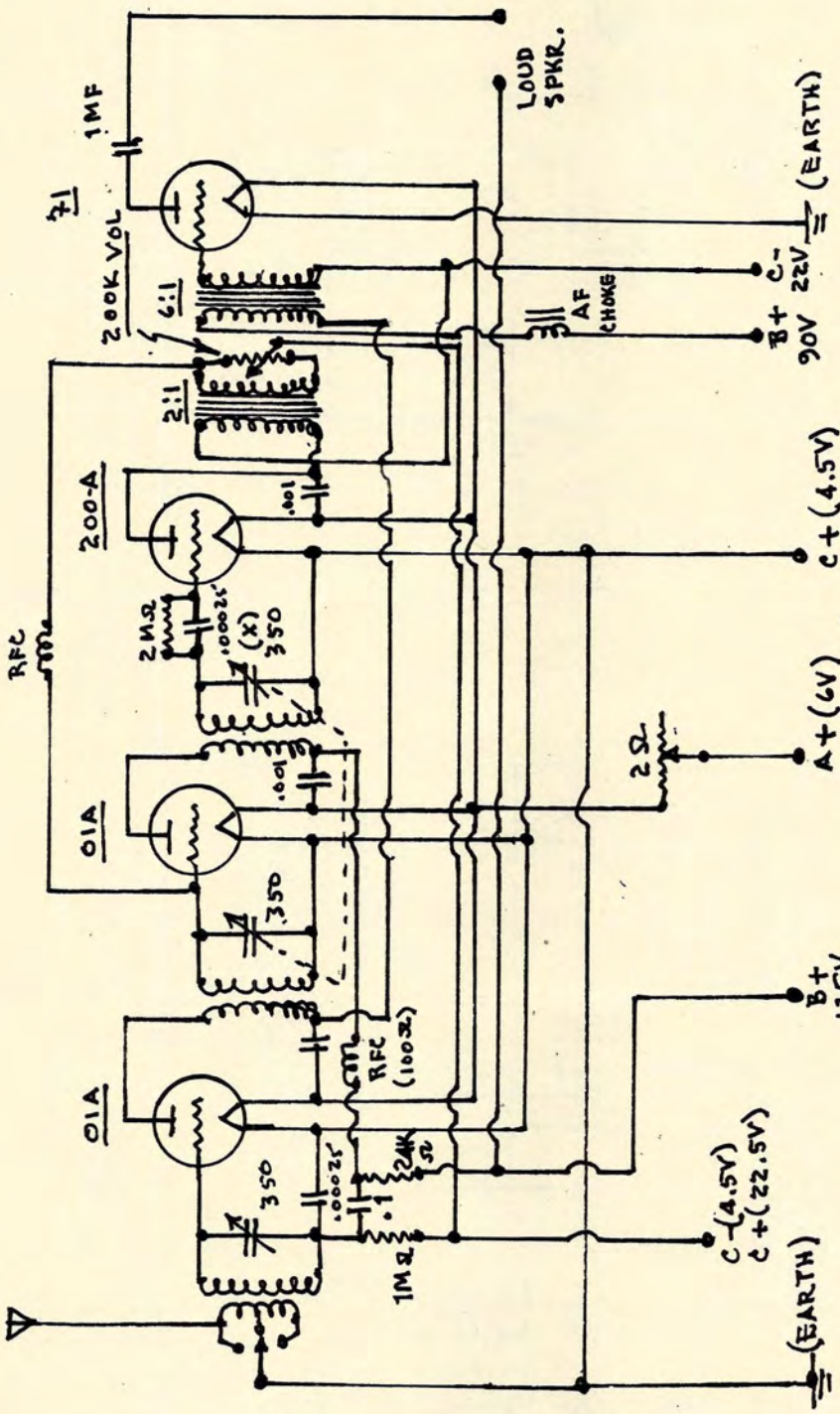
GRIMES "INVERSE DUPLEX", 1927



(RB 1-2-3-27)

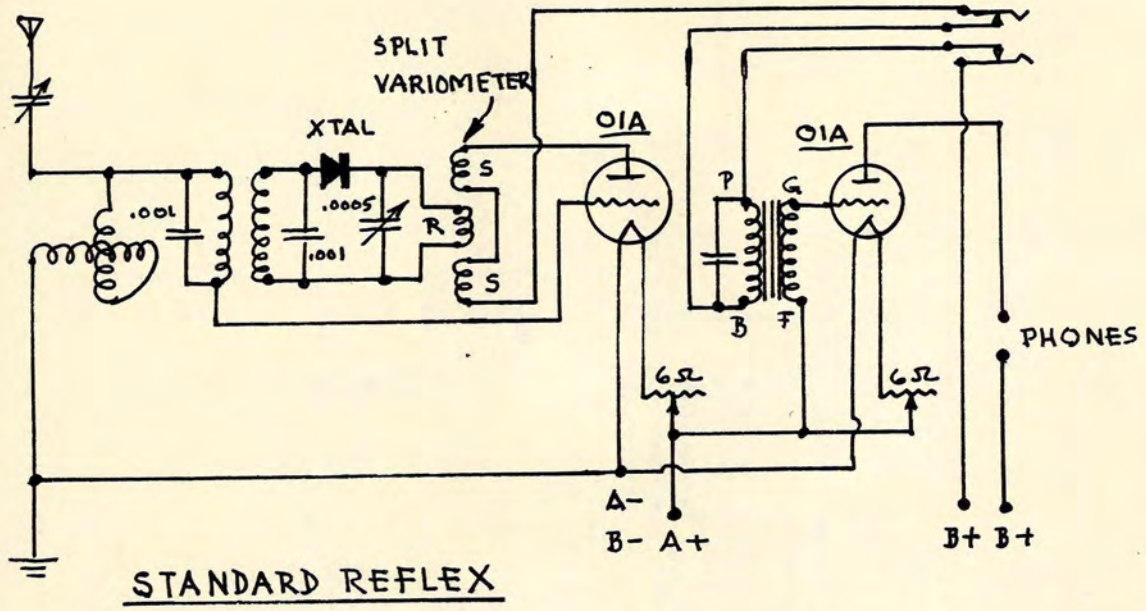

IMPROVED GRIMES INVERSE DUPLEX, 1927
IMPROVED GRIMES INVERSE DUPLEX (1927)
1mf
CONE SPKR.
AF choke
71
2:1
250K
25K
RFC .75mH
.1
1MΩ
B+ 135V
A+
B-
C- 4.5V
B+ 22.5V
A-
C+
GND
50 mH RFC
2M
200Ω
.00025
350
92T
9T
.001
8Ω
01A
6:1
B+ C- 90V 22.5V
NOTE: Audio polarity is critical; see Sht. 2 for details.
(RB 2-27)

GRIMES "INVERSE DUPLEX" VARIANT
(1927)

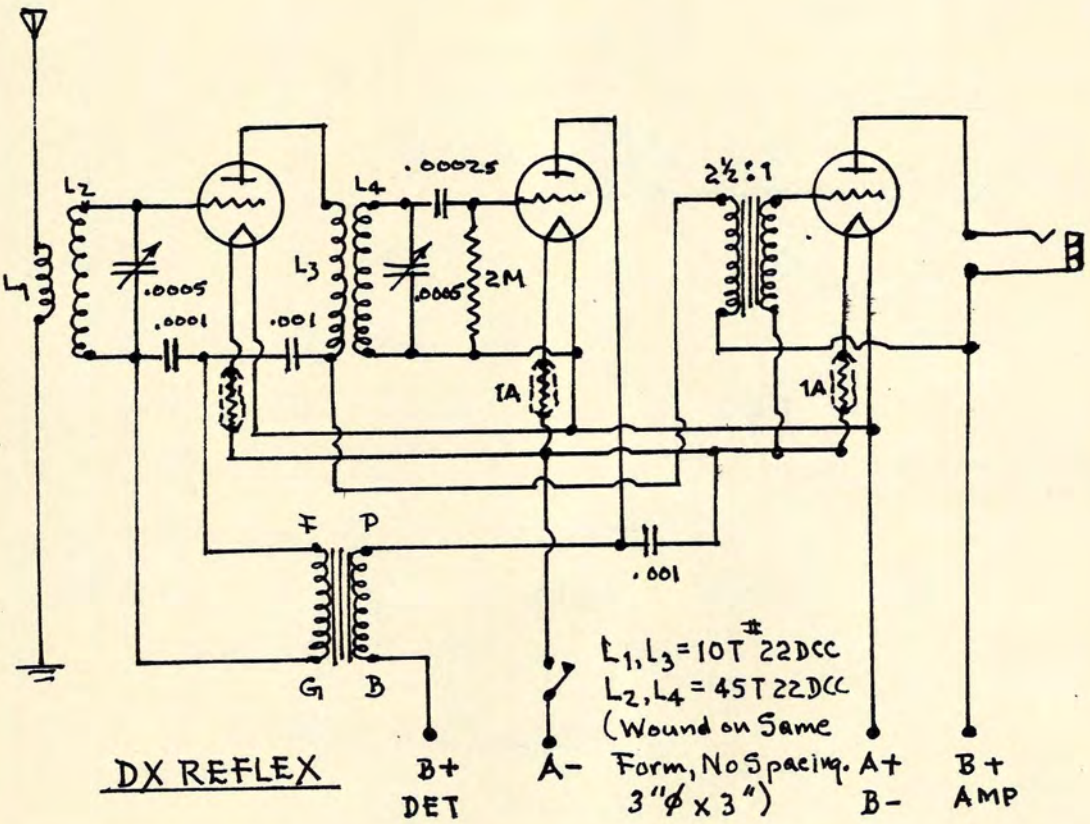


(2) 22.5V "C"-BATTERIES REQUIRED.
(1) 4.5V "C" BATTERY.
(X) = BAND-SPREAD 15 MMFD. (INSTALL @ (X)).

REFLEX RECEIVERS, 1922-1925

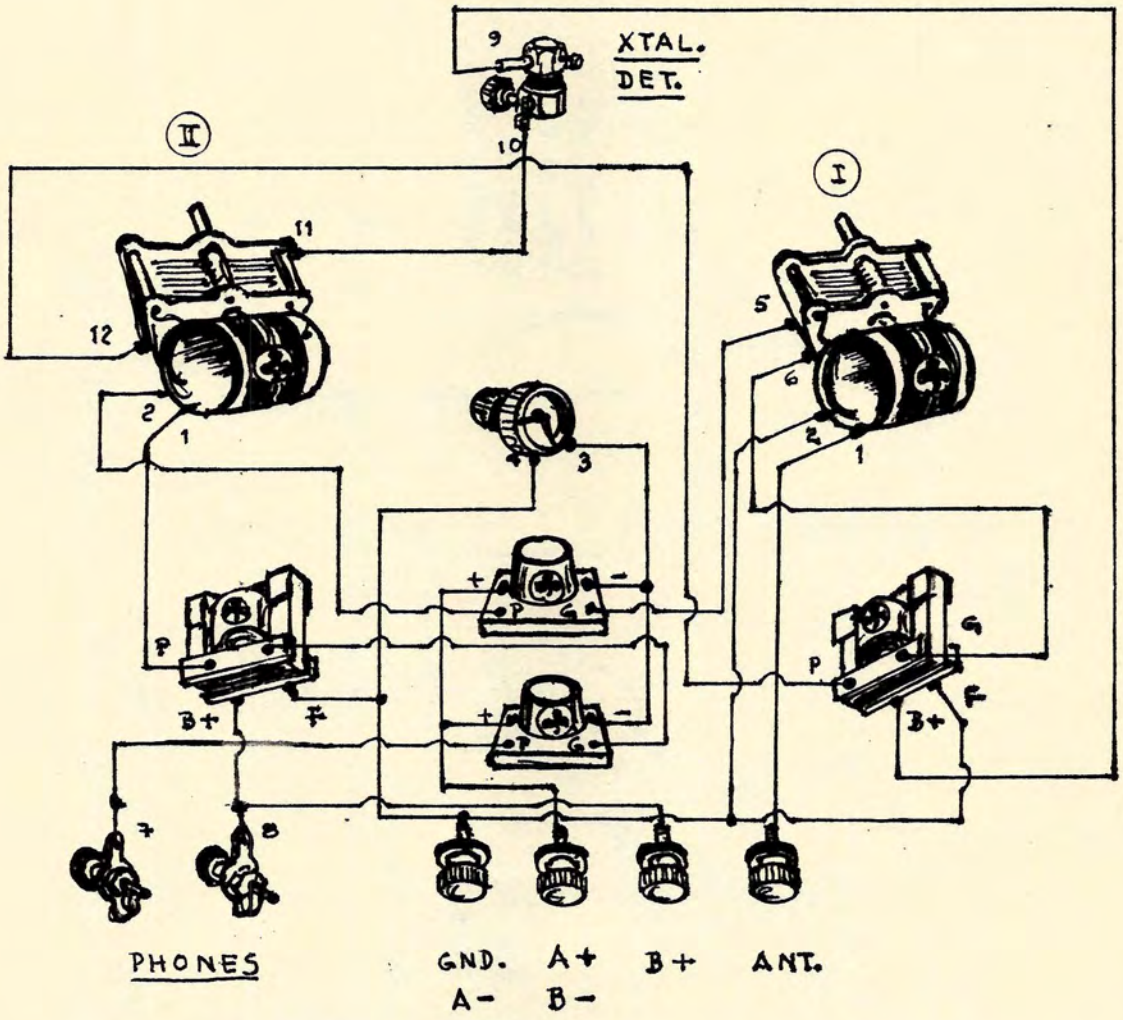


STANDARD REFLEX

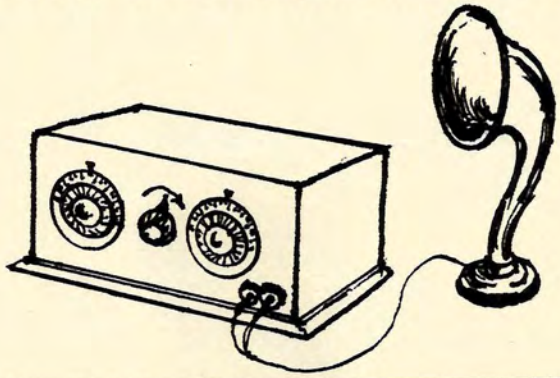


DX REFLEX

SHAMROCK 2-TUBE REFLEX RECEIVER; 1924:
(BASED ON HARKNESS CIRCUITRY)

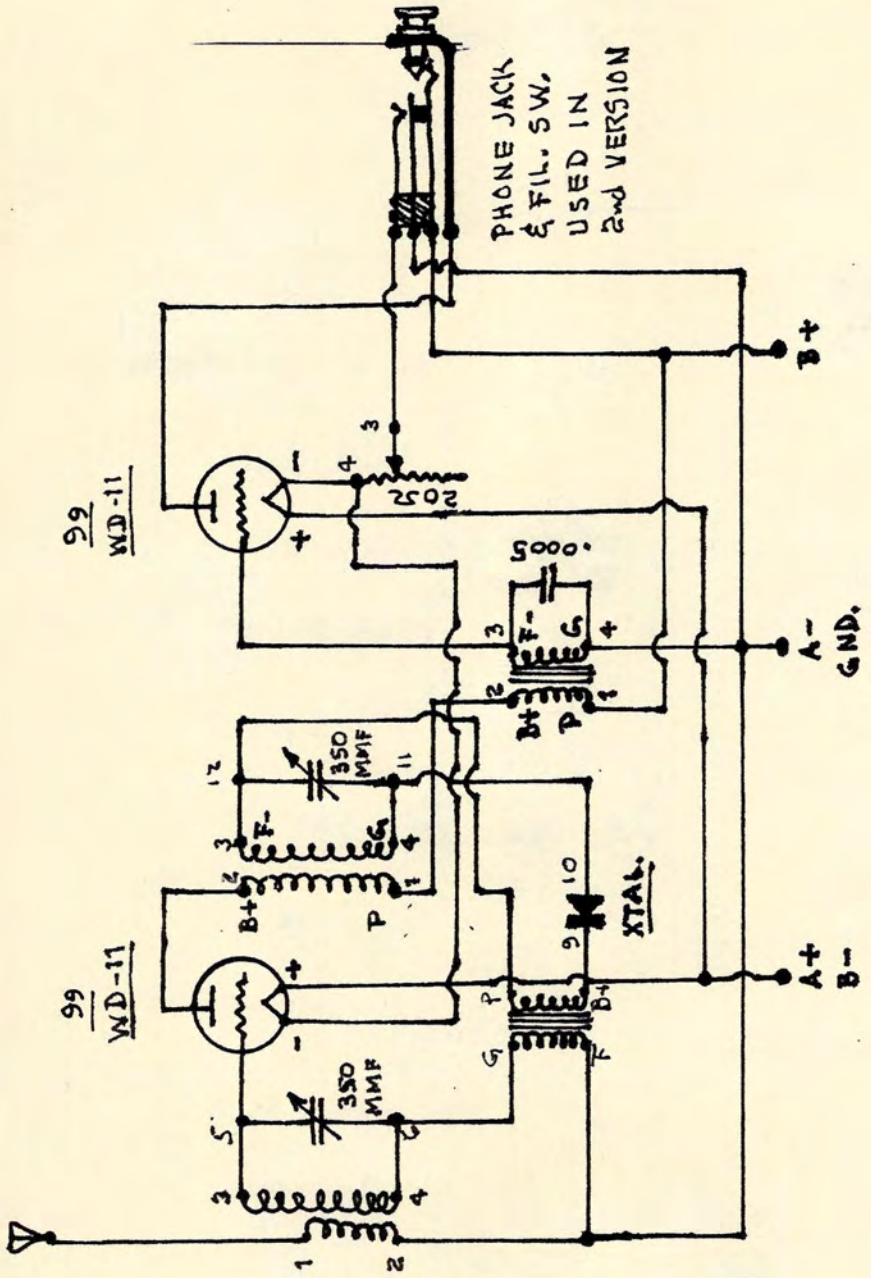


SUB-SCRIPT NOS. = SHAMROCK DESIGNATIONS.
CO. ALSO OFFERED "Shamrock Radio Builders' Guide", for 10¢.



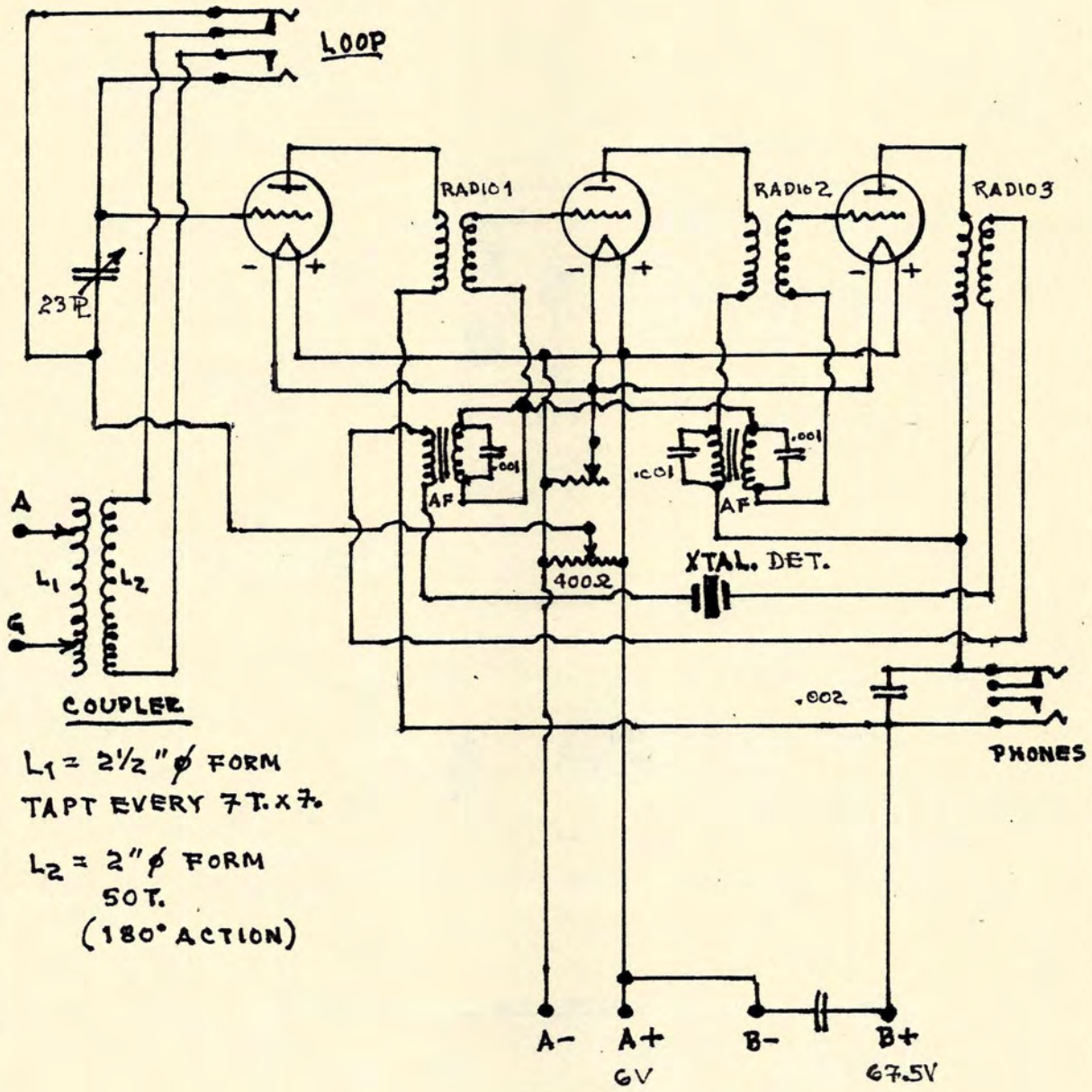
(R 8/12-24)

SHAMROCK 2-TUBE REFLEX; 1924
(Sht. 2)



AVAILABLE AS A KIT @ $35.
(SHAMROCK TAKEN OVER BY MARTI, Newark, 1932.)

DeFOREST REFLEX CIRCUIT, 1922/1923

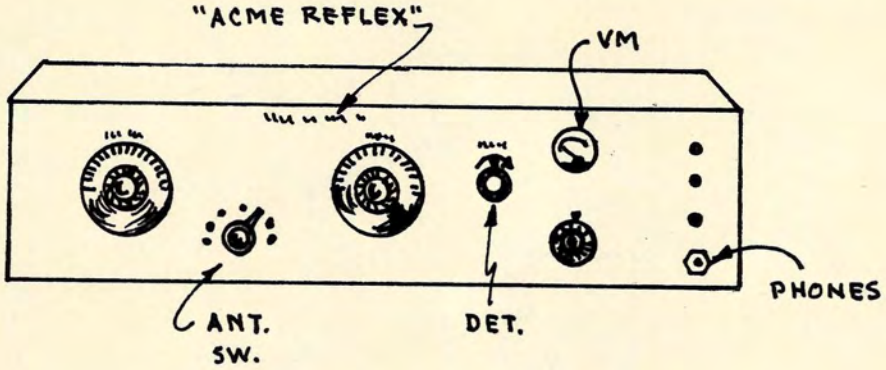


1. All jacks were Pacent #63.
2. All fixed condensers by Dubilier.
3. Rheostat was of the large capacity type.

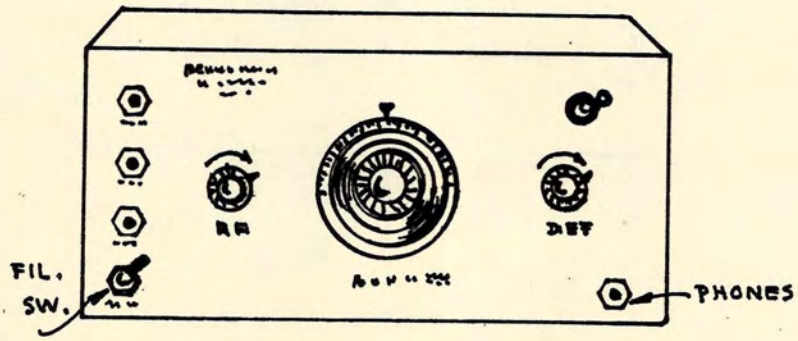
(R 7-23)

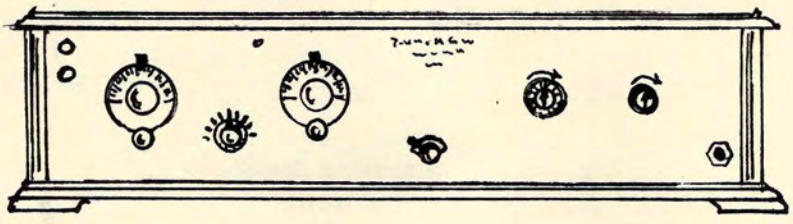
EARLY ACME CABINET CONFIGURATIONS

ACME REFLEX, 1923



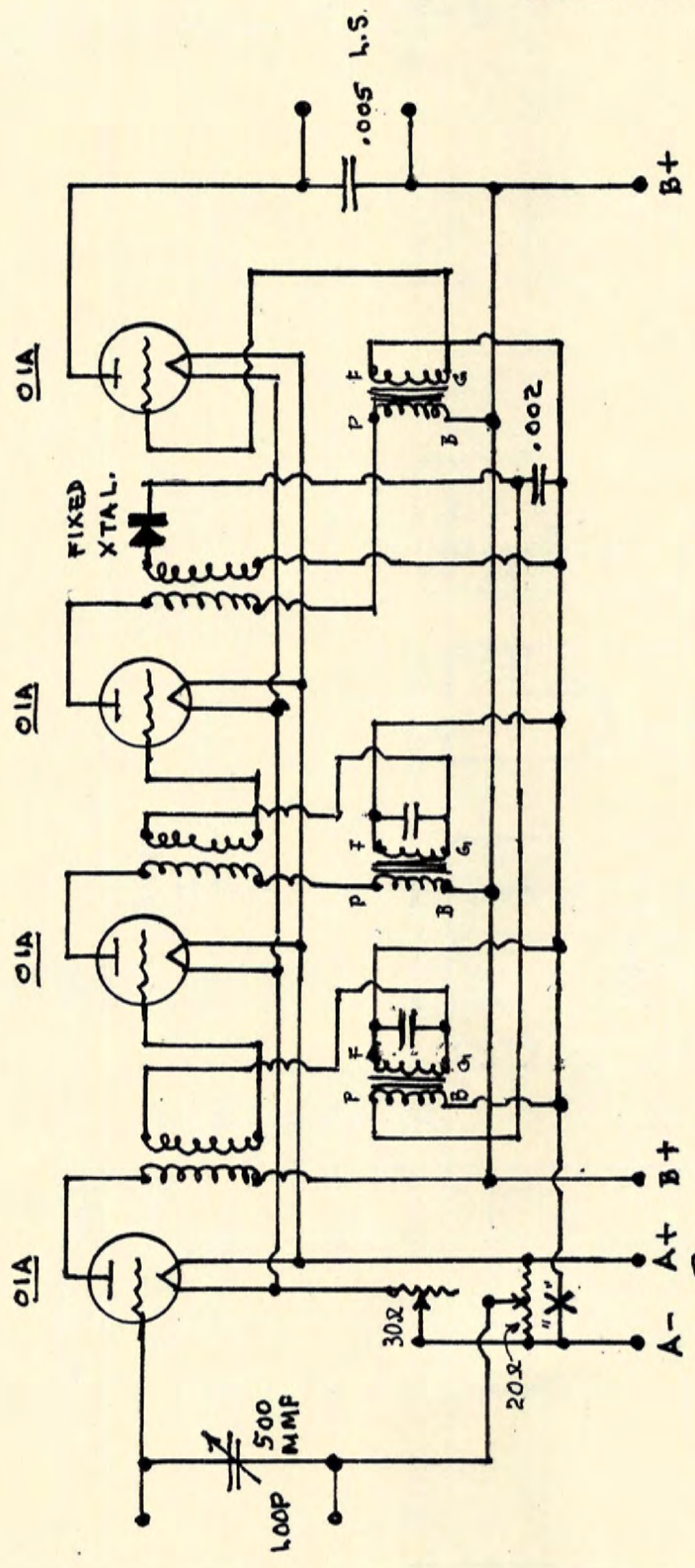
ACME 4-TUBE REFLEX, 1924





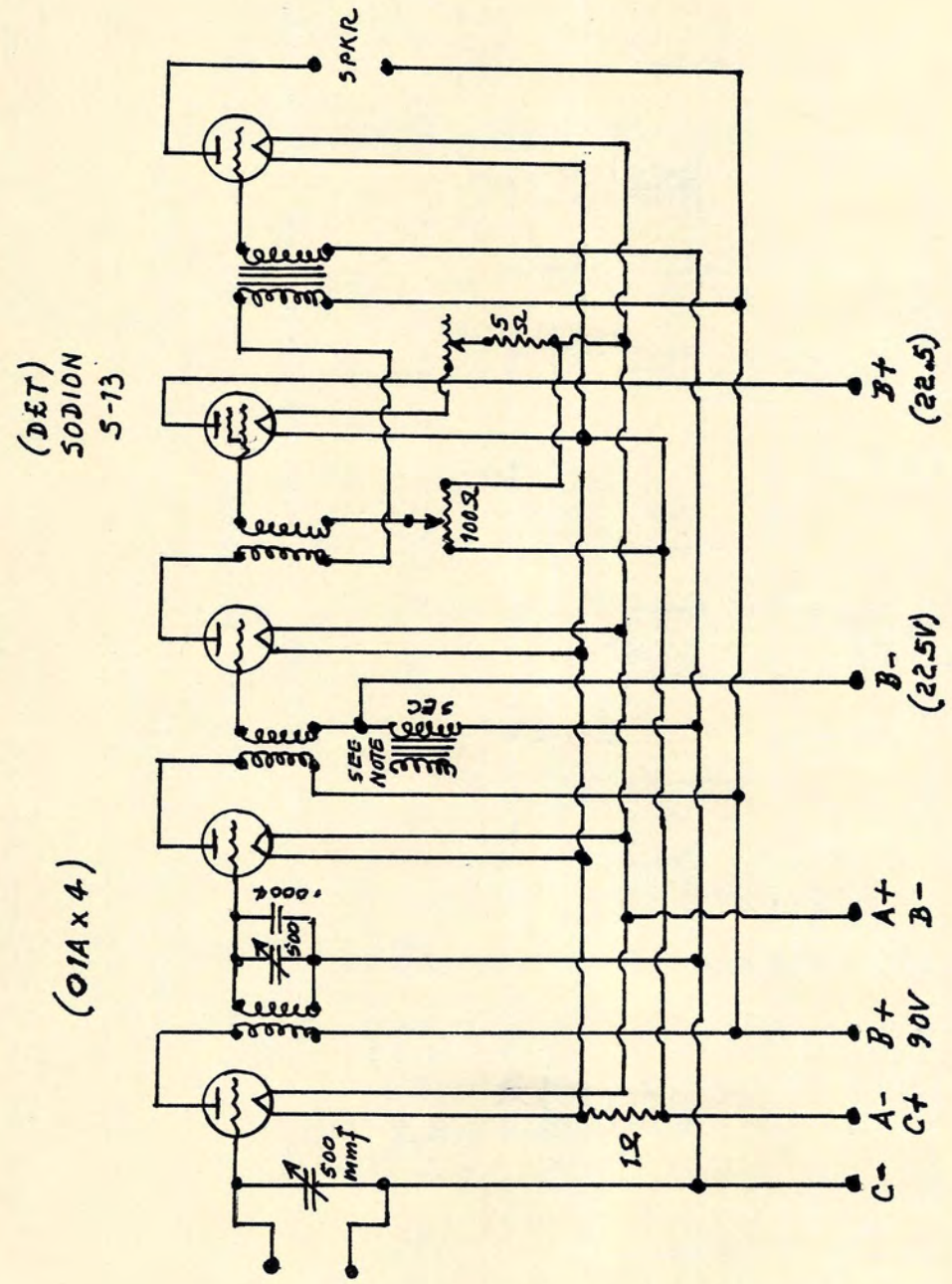
TERLEE-ACME RFFLEX. 1924

ACME 4-TUBE REFLEX CIRCUIT, 1923



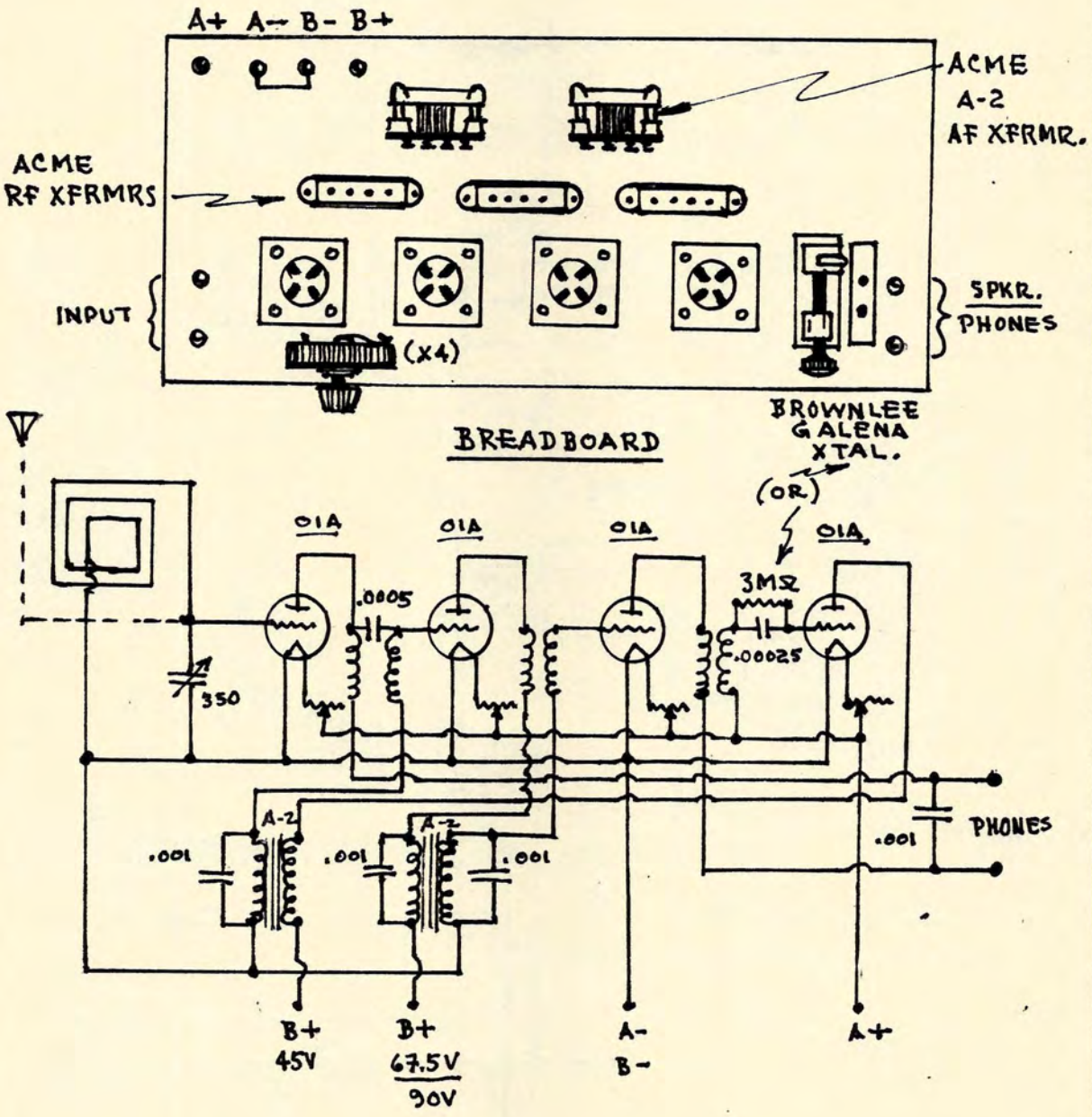
NOTES:
1. If set oscillates or howls, try rewersing leads of AF transformers one pair at a time.
2. The use of a "C" battery is recommended, installed at "x".
3. Loop = 15 turns #22 Litz. wire spaced 3/8" apart, wound in a spiral on sticks three feet long. (This was a special loop, but you will find that conventional loops will work.)

ACME-CABOT REFLEX W/S-13
(1923)



NOTE: PRI NOT CONNECTED.

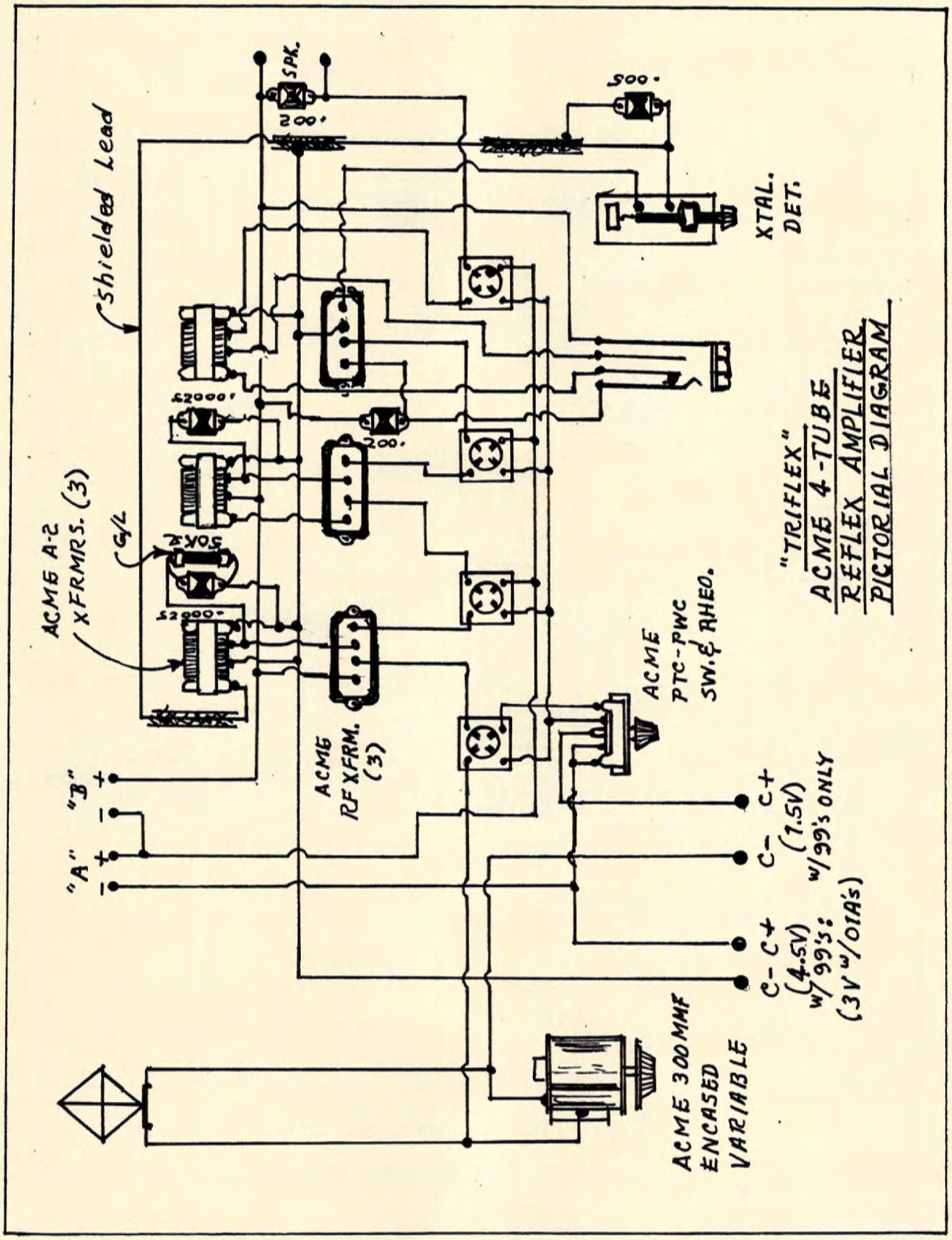
ACME FOUR-TUBE REFLEX, 1923



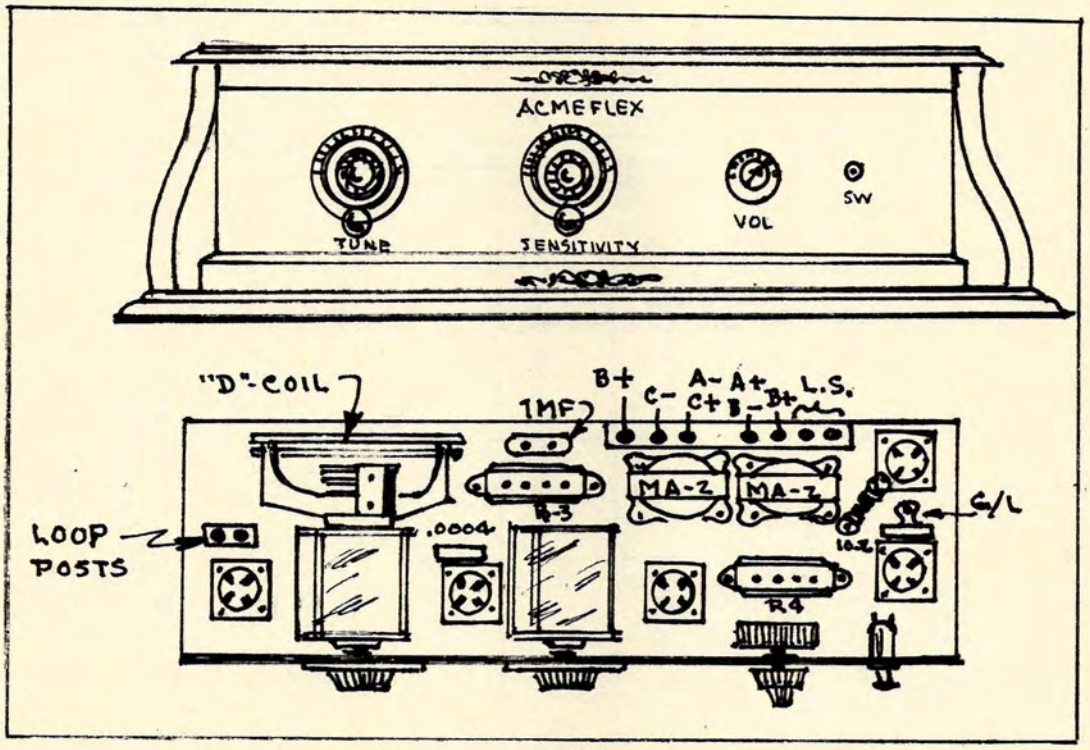
NOTES:

1. ACME "Kleerspeaker" Originally Recommended.
2. Variable Condenser Omitted From BREADBOARD Sketch for Clarity.

(CB 11-23)


SPK.
200.
500.
Shielded Lead
XTAL. DET.
.0002?
200.
50K?
.0002?
ACME A-2 XFRMRS. (3)
G/L
ACME RF XFRM. (3)
ACME PTC-PWC SW. & RHEO.
"TRIFLEX"
ACME 4-TUBE
REFLEX AMPLIFIER
PICTORIAL DIAGRAM
"B"
"A"
C- C+ (4.5V) w/99's: (3V w/01A's)
C- C+ (1.5V) w/99's ONLY
ACME 300 MMF ENCASED VARIABLE

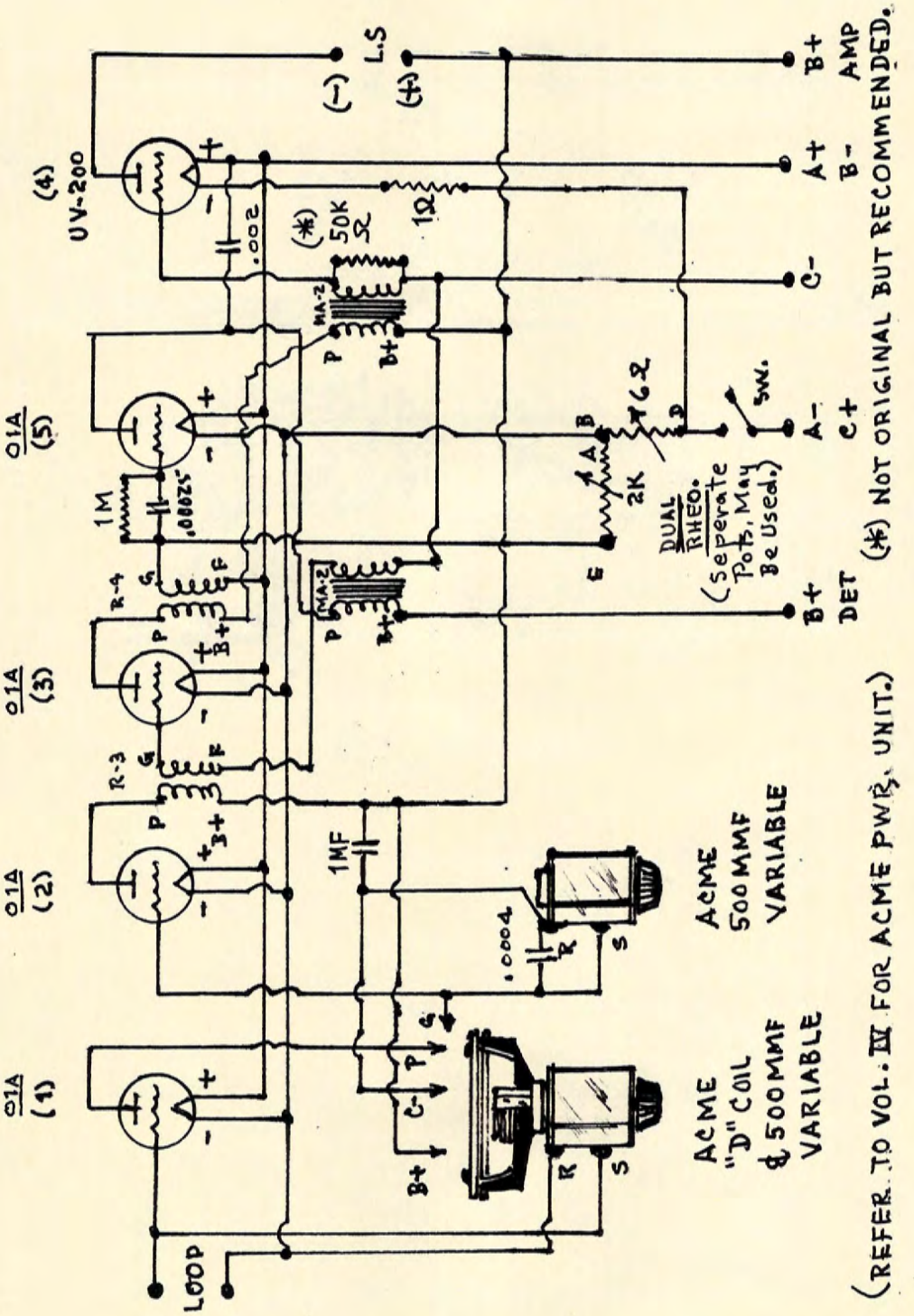
"ACMEFLEX" 5-TUBE "D"-COIL RCVR., 1926
(Sht. 1)

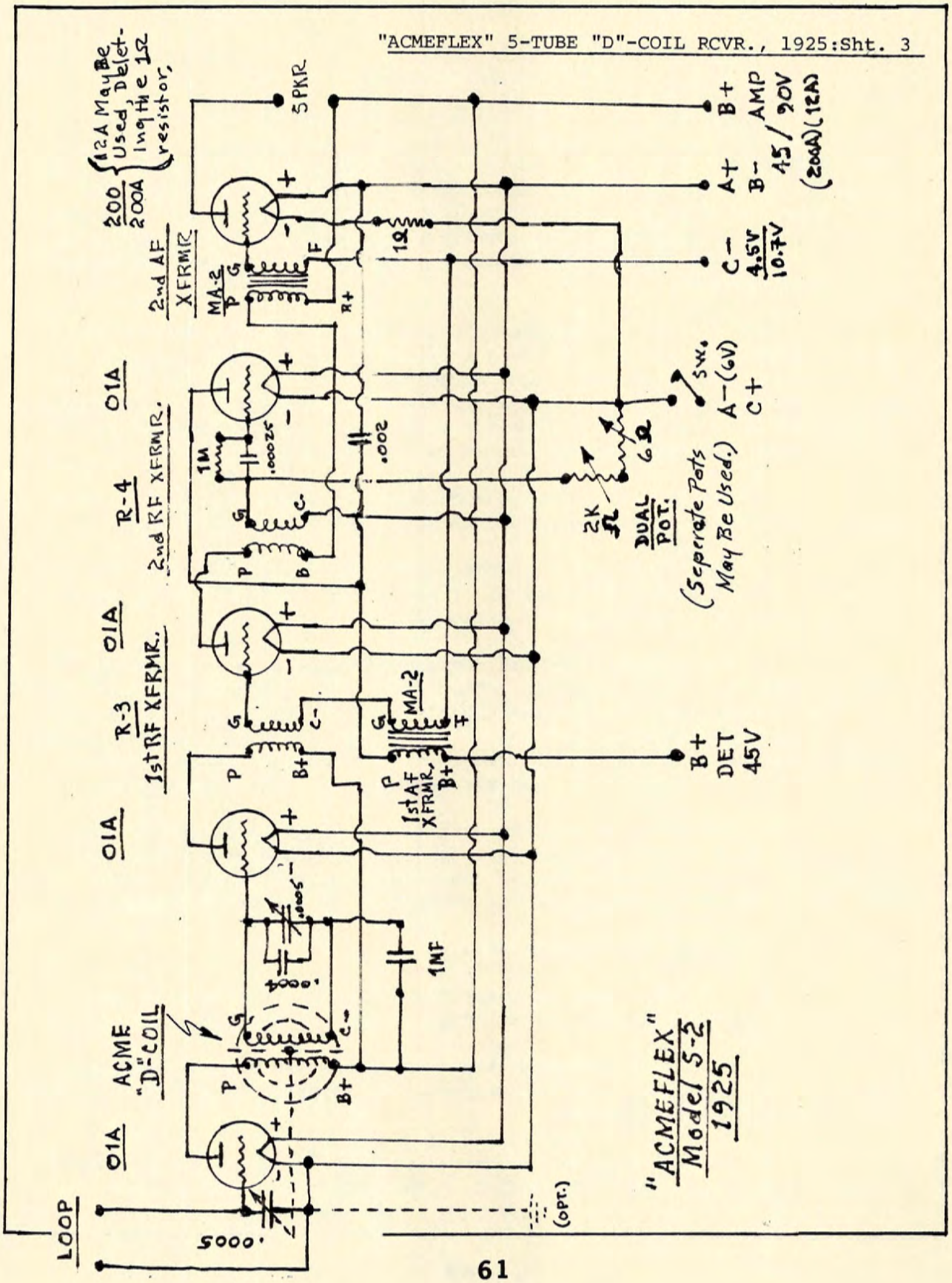


PARTS LIST

ACME MA-2 AF Transformers. (2)
ACME R-3 RF Transformer.
ACME R-4 RF Transformer.
ACME "D"-Coil Assembly; 500 MMF Variable.
ACME 500 MMF Variable.
Dual Rheostat 6-ohms/2K-ohms.
10-ohm Resistor.
500K-ohms Grid-Leak.
.00025 MF Condenser.
.002 MF Condenser.
.0004 MF Condenser.
1 MF By-Pass Condenser.
Panel = 7" x 24": Sub-Panel = 7" x 23".
9 Binding Posts.
3" Vernier Dials.
20 Pcs. Tinned #14 Buss-Bar, 24" Long.

"ACMEFLEX" 5-TUBE "D"-COIL RCVR., 1926
(Sht. 2)




"ACMEFLEX" 5-TUBE "D"-COIL RCVR., 1925:Sht. 3
LOOP
5000
(opt.)
01A
ACME "D"-COIL
01A
R-3 1st RF XFRMR.
01A
R-4 2nd RF XFRMR.
01A
2nd AF XFRMR
MA-2
5 PKR
200/200A
12A May Be Used, Deleting The 12 Resistor.
1M
.0002
.002
1MF
.0005
2K
DUAL POT.
(Separate Pots May Be Used.)
60
SW.
A-(6V)
C+
B+
A+
B-
C-
4.5V
10.5V
45/90V AMP
(200A)(12A)
B+ DET 45V
"ACMEFLEX" Model 5-2 1925

ACMEFLEX D-COIL NOTES

While reflex ciruits, per se, have never held much interest for me, when I came by the ACME "D"-Coil I was fascinated by its exotic configuration. It was incredible, considering the period in which it was produced. So I set about acquiring a box-full of originally specified ACME parts, in order to construct the "ACMEFLEX" circuit which took about a year of casual searching. The results of my searching may be found in several volumes of these Sketch-Books - i.e., power supplies, amplifiers, other receivers, etc.

The circuit was assembled easily enough, but instead of the usual evening required to construct a circuit, this circuit required a full week before all of the "bugs" could be removed. Today, it gives me quite acceptable reception, within the limitations of the loop. However, if you have an inoperative "ACMEFLEX" gathering dust, or you feel you'd like to construct one, my experiences may be of passing interest.

1. The use of specified ACME parts is mandatory, with a carefully considered exception here and there, as will be noted.

2. ACME M2 AF xfrmrs. were originally called for, and they are extremely well-made units. However, if you have a pair of ACME A2 xfrmrs. at hand, they will function satisfactorily, with less output.

3. The "D"-Coil and its companion Variable have integrated vernier controls - most essential. They are of the push-pull variety, and the large rubber contact will undoubtedly have hardened over the years. They can be rendered resilient again by soaking over night (after removal from the variables) in any good rubber-revilatlizer. Tuning of both of the variables is razor-sharp, and the verniers are really necessary.

4. The set will go into oscillation with the slightest jar, the passing of a foreign motor-car outside, the rumble of a train, or turning on electric-light switches. When this happens, back off the SENSITIVITY control, then gradually creep back to the prior setting.

5. DO NOT GROUND THIS SET!

6. A 2-point loop is specified. If you have a 3-point loop, connect the inner and outer leads and leave the center lead unattached.

7. While the specified ACME R-3 and R-4 RF xfrmrs, work best, I found that "DURATRAN" and "All-American" RF xfrmrs. (of the same period) will give satisfactory results.

8. The ANT lead must go direct to the "G" post on the first RF tube, then to the "D"-Coil stator. Reversing these creates howl.

ACMEFLEX D-COIL NOTES (Cont.)

9. Like all early reflex circuits, this circuit will squeal uncomfortably when the received signal is centered. To control this, always start tuning with the VOLUME control at its lowest point. When a noise is heard, rock the SENSITIVITY control. If it is a legitimate signal, gradually turn up the volume. This may also require rocking the SENSITIVITY control some more.

10. While the schematic diagram calls for a speaker, this set operates most comfortably on phones, of the high impedance type.

11. While this receiver is quite stable, it is not very sensitive beyond pulling in powerful local stations. This may have been quite enough for our early set-builders, as any sort of reception would have been construed as a successful receiver, but I admit to being a bit disappointed at its "DX" ability. The farthest station received was from Sacaramento, a distance of approximately 80 miles.

12. In terms of tone - i.e., fidelity of sound - this set is impressive. Substituting a 12 or 12A for the 01A in the output stage will enhance the volume, provided you use 135 volts instead of 90 for the plate.

13. The knobs of both the variables and the vernier control are of the screw-on type, and unless you secure them tightly when first attaching them, they have a habit of backing themselves off in a sudden twist, or if the vernier was not fully disengaged.

14. A wire antenna may be used, with a .00015 mfd condenser in the wire before attaching to the variable, and running the stator lead to either A- or A+; you'll have to try both, but a loop is best.

15. All 3-point loops were not the same, and you might want to try the outer and center leads for best reception.

16. If you use a B-Eliminator, check the polarity of the AC line very carefully; otherwise you'll have a large hum at all settings.

17. A strong local station will come in at several points on the dial, and cannot be obviated by rotating the loop or installing one of the wave-traps of the period. Shorten your ANT or loop.

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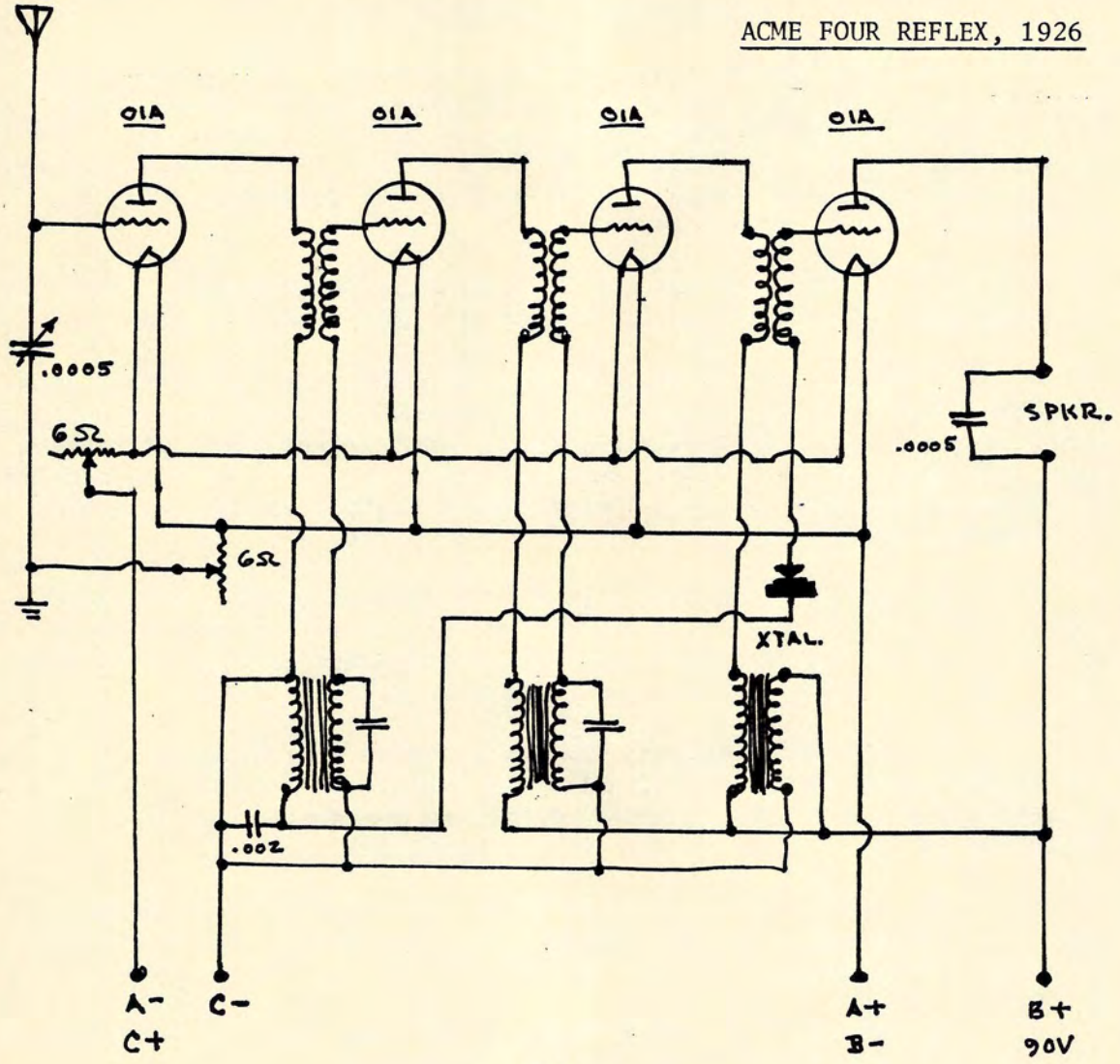
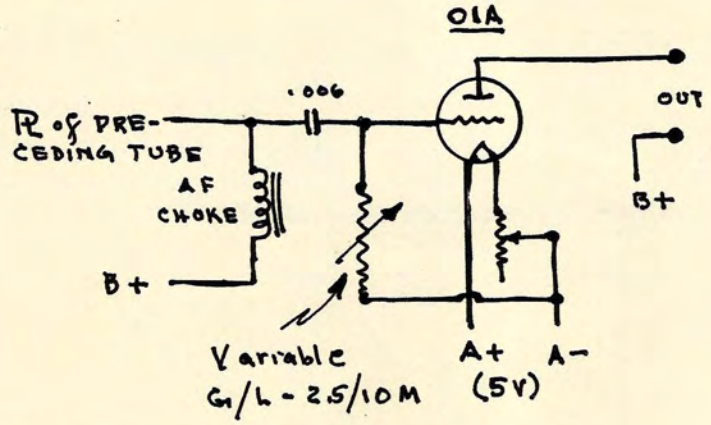
ACME FOUR REFLEX, 1926

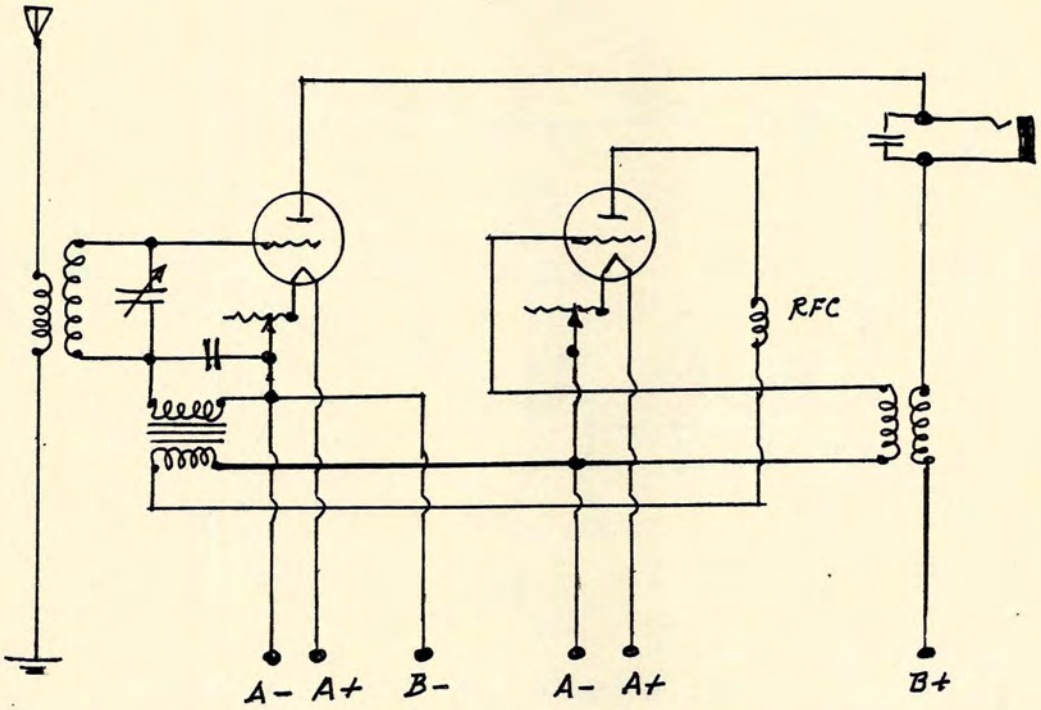




AF CHOKE MAY BE 1/2 OF ANY SHORTED AF XFMR.

(AH-II-26)

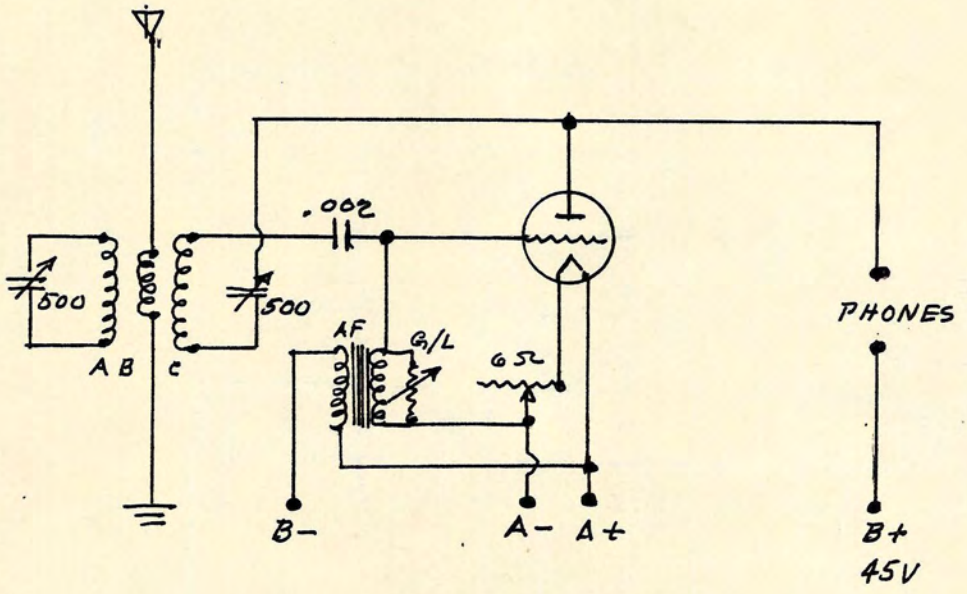
VARIANT



ONE of LATOUR's MANY REFLEXES

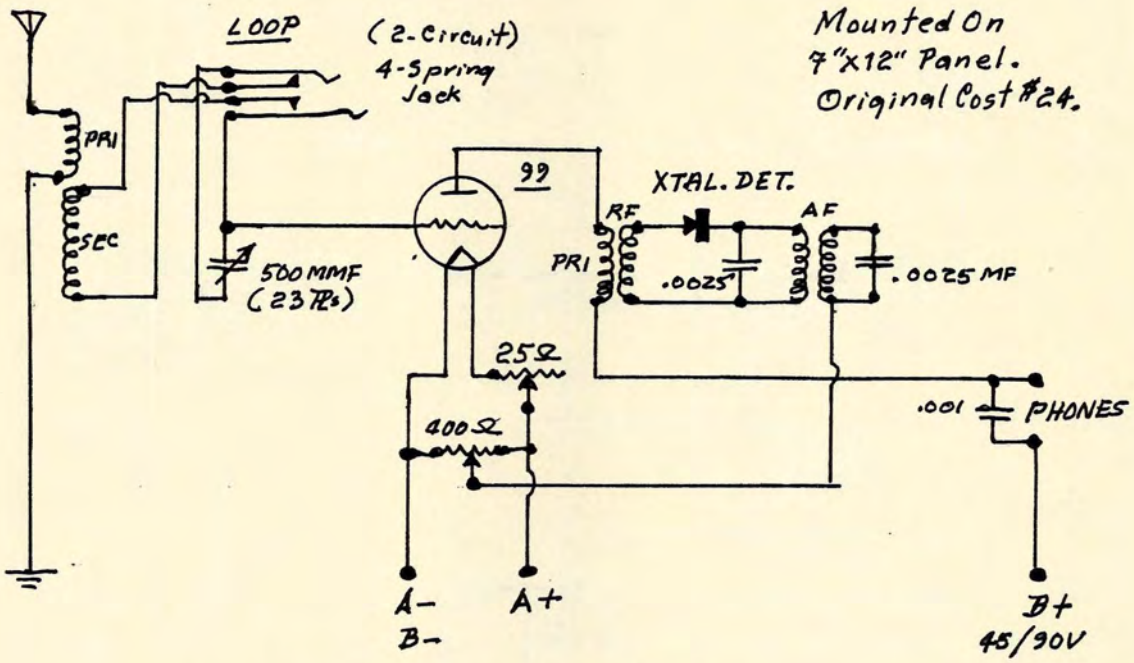
Stabilisation is obtained w/out a potentiometer. An AF input circuit feeds back into the first tube from the PP circuit of the 2nd tube. The xfrmr used for the AF input into the 1st PP have capacity in each winding & capacity between its windings — a condenser effect. The potential distribution & coupling of proper values can stabilize the RF amplifier against self-oscillation.

"ULTRA-AUDION" REFLEX, 1925



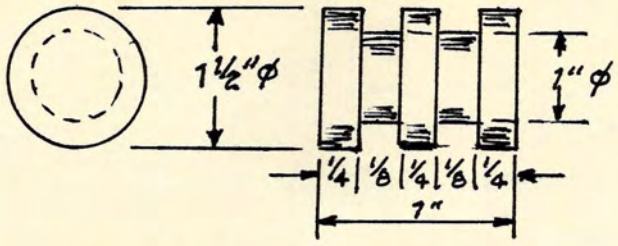
Variable Grid-Leak.
All coils wound on a 3½" ϕ form x 6" long, as follows:
A = 38T, #22 scc wire.
B = 12T, " " " .
C = 45T, " " " .

ONE TUBE REFLEX, 1925



AF XFRMR. = PRI 8T, #20/#22 DCC.
SEC 48T, " ".
Form = 4"ϕ.

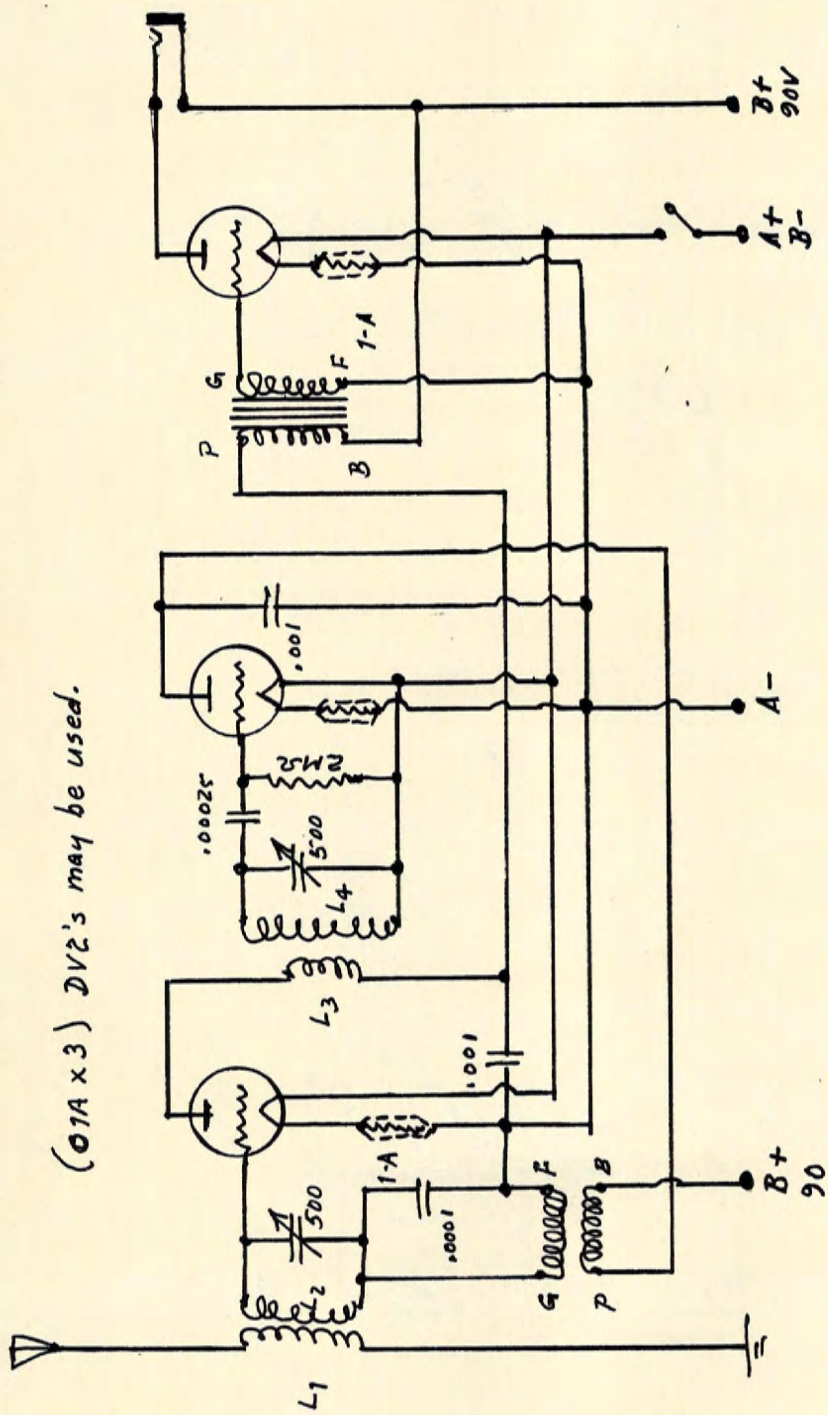
RF XFRMRS. = 175T each slot to make PRI & SEC; #36 SSC or enamelled wire. Wire from a FORD spark-coil may be used, but SSC is preferred.



RF Xfrmr. core form: fibre or Bakelite rod.

(RD)

THE "FREEDOM" REFLEX, 1925



(01A x 3) DV2's may be used.

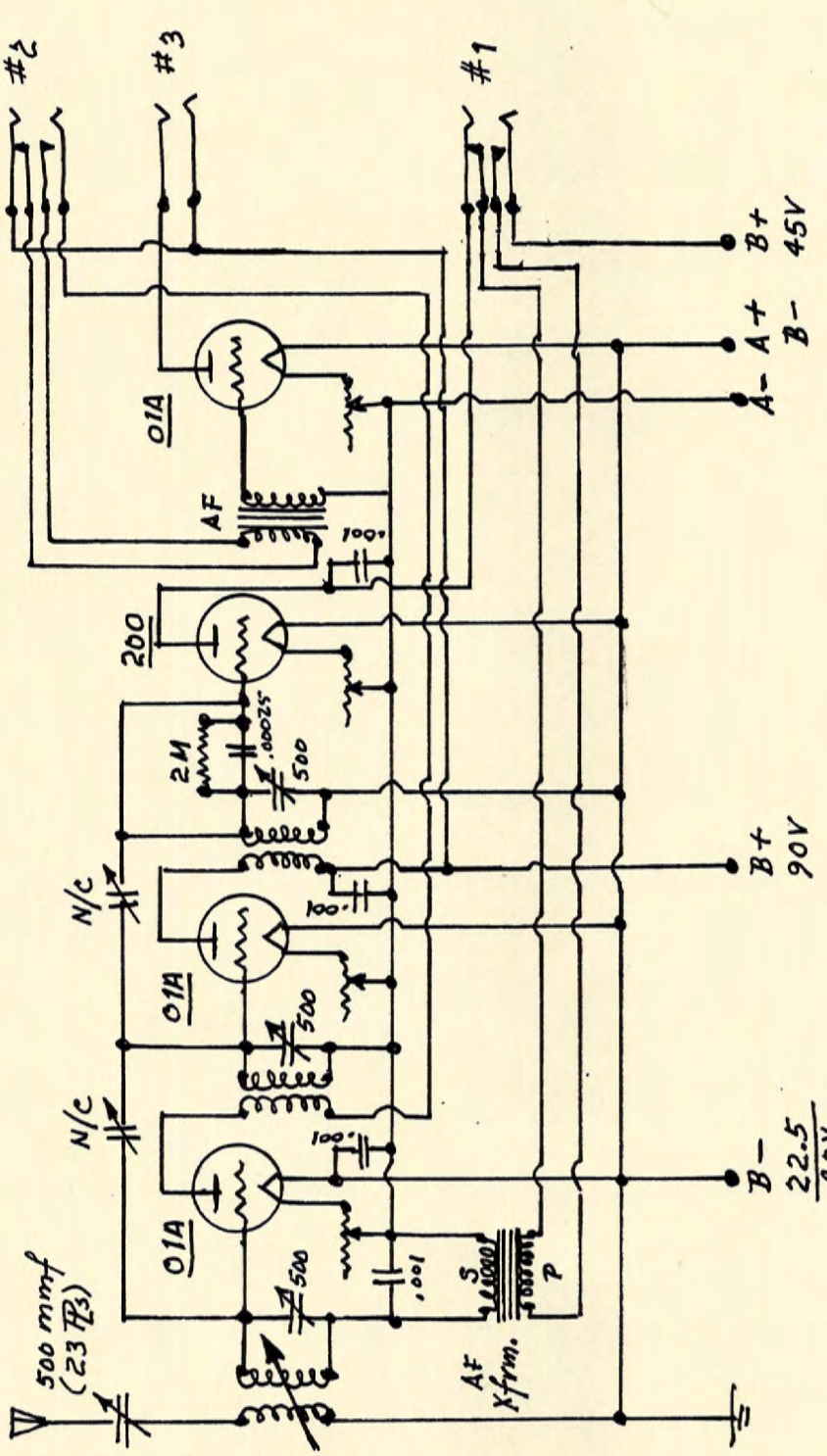
COIL DATA:

L_1 = 17T #22 DCC; 3½" ϕ Form.
L_2 = 43T
L_3 = 12T
L_4 = 45T

PANEL = 7" x 18" x 3/16".
BASEBOARD = 7" x 17" x ½"
Coils @ right angles to each other.
The .001 condenser is mounted across the SEC of the reflex AF xfrmr.

(RW 7.9.25)

REFLEXED NEUTRODYNE, 1926



REFLEXED NEUTRODYNE, 1926

(4) Rheostats, 6Ω each.

(Henley)

REFLEX MONOGRAPH ADDENDA

The principle difficulty experienced by home-constructors, as well as designers of reflex circuits, was the tendency of the sets to howl when tuned to resonance. This was especially true of circuits employing more than one tube. The cause was usually incorrect capacities of the by-pass condensers, unwanted feed-back from stray magnetic fields, or carelessness of construction. The unwanted feedback was caused by non-astatic-wound coils, a winding strongly recommended by the National Bureau of Standards - which they had designed.

REFLEX CAUTIONS:

1. If you cannot get regeneration, reverse the Tickler windings; omit the by-pass at the phones; or increase the plate voltage.
2. If tuning is broad, shorten your antenna.
3. To increase Selectivity, place a 100-mmf variable in series with the GND lead.
4. If you cannot get the higher wavelengths, shunt your ANT and GND with a 100-mmf fixed condenser.
5. Scratching noises are caused by a defective battery.

Dial readings of a reflex, once logged, are exact - unless it is raining.

A reflex with regeneration is to be desired. Regeneration in the DET plate circuit increases the receiving range considerably.

The reason rain spoils reflex reception is that the capacity of the ANT changes, due to leakage of energy from the ANT, along with the water resistance of the ANT.

The design evolution of several marques are listed in this Monograph, as you have undoubtedly noted. By studying these case-histories, as it were, you can follow the evolution of the designer's way of thinking. While it is quite easy to construct the last, or final, circuit design and expect to have an efficient set, you really should start with the first design, and "improve" it by subsequent changes, as made by the designer. In that way you will parallel the intellectual and emotional progress of the designer, which could be edifying.

* * *
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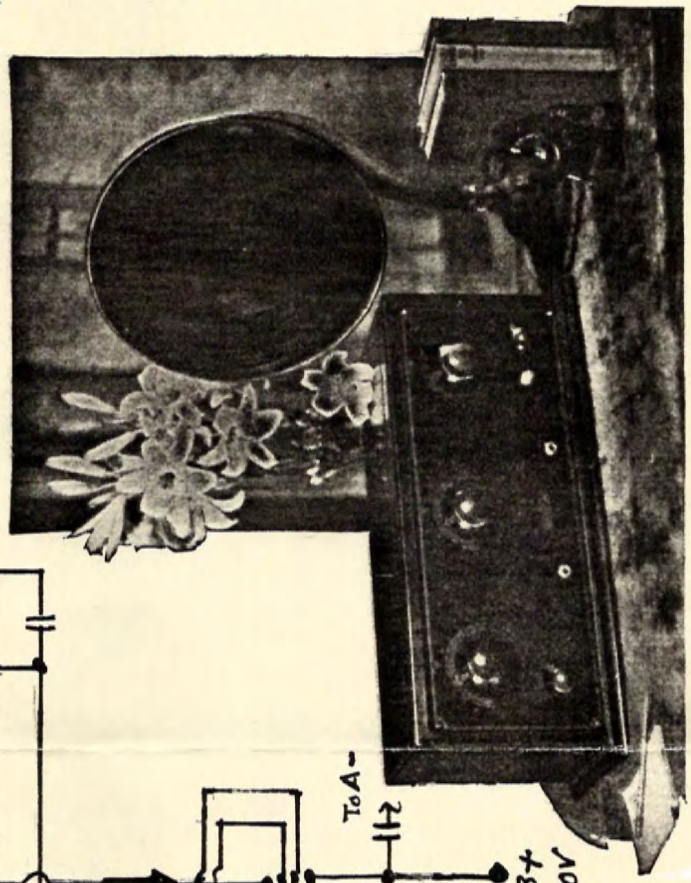
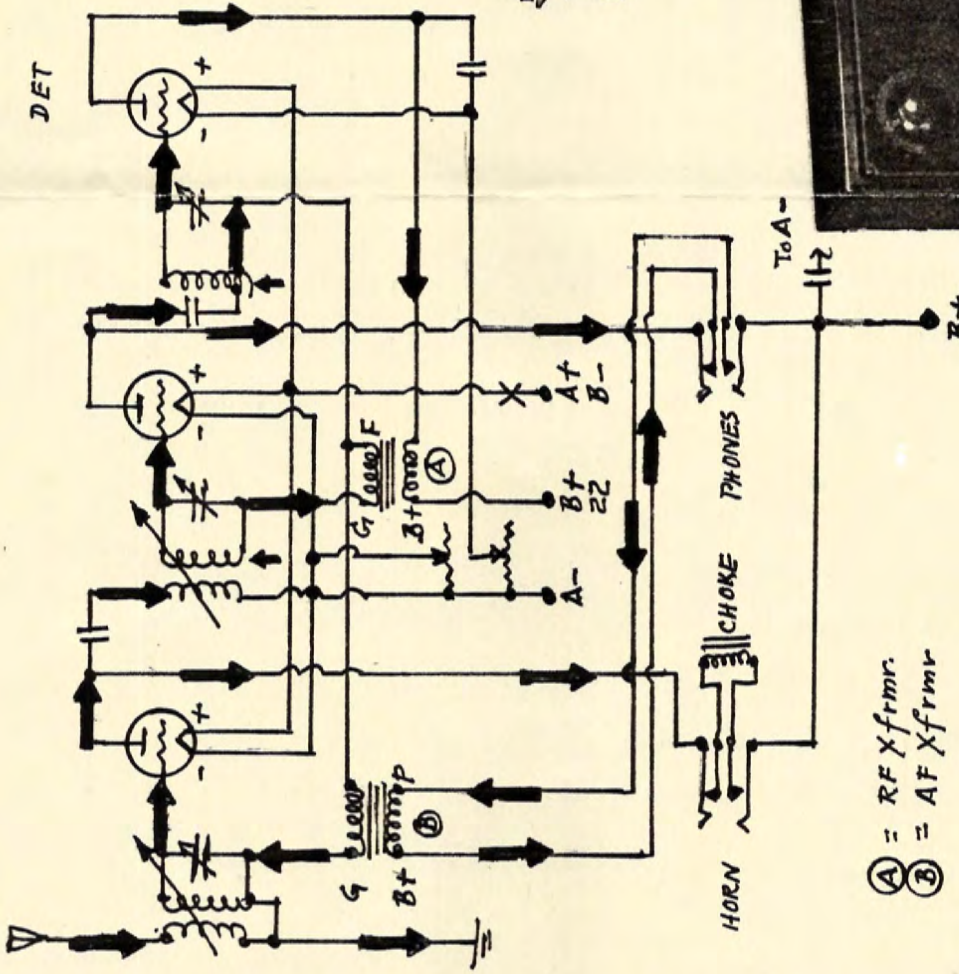
G.M./DAY-FAN 3-TUBE REFLEX, 1924

GENERAL MOTORS / DAY-FAN 3-Tube Reflex (1924)

Model OEM-11 Threetubes-$90





Beyond Rider!

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